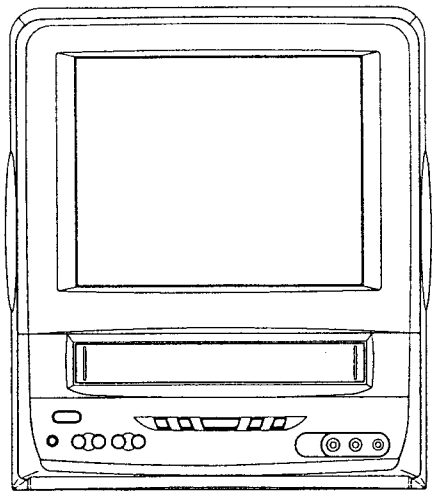
SERVICE MANUAL

ORION

COMBI 2612 / 2612SI

COLOR TELEVISION/VIDEO CASSETTE RECORDER



ORIGINAL
CHASSIS CODE B

VHS PAL

Best. Nr. SM2612

Design and specifications are subject to change without notice.

SERVICING NOTICES ON CHECKING

1. KEEP THE NOTICES

As for the places which need special attentions, they are indicated with the labels or seals on the cabinet, chassis and parts. Make sure to keep the indications and notices in the operation manual.

2. AVOID AN ELECTRIC SHOCK

There is a high voltage part inside. Avoid an electric shock while the electric current is flowing.

3. USE THE DESIGNATED PARTS

The parts in this equipment have the specific characters of incombustibility and withstand voltage for safety. Therefore, the part which is replaced should be used the part which has the same character.
Especially as to the important parts for safety which is indicated in the circuit diagram or the table of parts as a ⚠ mark, the designated parts must be used.

4. PUT PARTS AND WIRES IN THE ORIGINAL POSITION AFTER ASSEMBLING OR WIRING

There are parts which use the insulation material such as a tube or tape for safety, or which are assembled in the condition that these do not contact with the printed board. The inside wiring is designed not to get closer to the pyrogenic parts and high voltage parts. Therefore, put these parts in the original positions.

5. TAKE CARE TO DEAL WITH THE CATHODE-RAY TUBE

In the condition that an explosion-proof cathode-ray tube is set in this equipment, safety is secured against implosion. However, when removing it or serving from backward, it is dangerous to give a shock. Take enough care to deal with it.

6. AVOID AN X-RAY

Safety is secured against an X-ray by considering about the cathode-ray tube and the high voltage peripheral circuit, etc.
Therefore, when repairing the high voltage peripheral circuit, use the designated parts and make sure not modify the circuit.
Repairing except indicates causes rising of high voltage, and it emits an X-ray from the cathode-ray tube.

7. PERFORM A SAFETY CHECK AFTER SERVICING

Confirm that the screws, parts and wiring which were removed in order to service are put in the original positions, or whether there are the portions which are deteriorated around the serviced places serviced or not. Check the insulation between the antenna terminal or external metal and the AC cord plug blades. And be sure the safety of that.

(INSULATION CHECK PROCEDURE)

1. Unplug the plug from the AC outlet.
2. Remove the antenna terminal on TV and turn on the TV.
3. Insulation resistance between the cord plug terminals and the eternal exposure metal **[Note 2]** should be more than 1M ohm by using the 500V insulation resistance meter **[Note 1]**.
4. If the insulation resistance is less than 1M ohm, the inspection repair should be required.

[Note 1]

If you have not the 500V insulation resistance meter, use a Tester.

[Note 2]

External exposure metal: Antenna terminal
Earphone jack

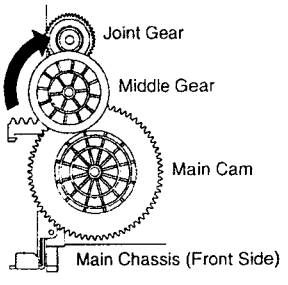
HOW TO ORDER PARTS

Please include the following informations when you order parts. (Particularly the CHASSIS CODE.)

1. MODEL NUMBER and CHASSIS CODE
   You can find it in the back of your unit.
2. PART NO. and DESCRIPTION
   You can find it in your SERVICE MANUAL.

IN CASE OF VIDEO TAPE JAM

1. Remove the Deck Chassis from the main unit.
   (Refer to item 1 of the DISASSEMBLY INSTRUCTIONS.)
2. Rotate the Middle Gear in the direction of the arrow by hand. Then take out the Video Tape. Be careful not to scratch on the tape.



CONTENTS

SERVICING NOTICES ON CHECKING A1-1
HOW TO ORDER PARTS A1-1
IN CASE OF VIDEO TAPE JAM A1-1
CONTENTS A2-1
GENERAL SPECIFICATIONS ..... A3-1~A3-4
DISASSEMBLY INSTRUCTIONS
1. REMOVAL OF MECHANICAL PARTS AND P. C. BOARDS B1-1, B1-2
2. REMOVAL OF DECK PARTS ..... B2-1~B2-5
3. REMOVAL OF ANODE CAP B3-1, B3-2
4. REMOVAL OF DEFLECTION YOKE B3-2
5. REMOVAL AND INSTALLATION OF FLAT PACKAGE IC B4-1, B4-2
KEY TO ABBREVIATIONS C1-1, C1-2
SERVICE MODE LIST C2-1
PREVENTIVE CHECKS AND SERVICE INTERVALS C3-1, C3-2
WHEN REPLACING EEPROM (MEMORY) IC C4-1
SERVICING FIXTURES AND TOOLS D1-1
MECHANICAL ADJUSTMENTS ..... D2-1~D2-4
ELECTRICAL ADJUSTMENTS ..... D3-1~D3-6
BLOCK DIAGRAMS
TV E-1, E-2
Y/C/AUDIO/HEAD AMP/21PIN/IN/OUT E-3, E-4
MICON E-5, E-6
T' TEXT E-7, E-8
POWER/OPERATION E-9, E-10
PRINTED CIRCUIT BOARDS
MAIN/CRT F-1, F-2
SYSCON/21PIN/DECK F-3, F-4
SYSCON/21PIN F-5, F-6
SCHEMATIC DIAGRAMS
Y/C/AUDIO/HEAD AMP G-1, G-2
MICON G-3, G-4
POWER/OPERATION G-5, G-6
CHROMA/IF G-7, G-8
SOUND AMP G-9, G-10
T' TEXT G-11, G-12
21PIN/IN/OUT G-13, G-14
TV POWER G-15, G-16
DEFLECTION G-17, G-18
CRT G-19, G-20
DECK G-21, G-22
INTERCONNECTION DIAGRAM G-23, G-24
WAVEFORMS ..... H-1~H-4
MECHANICAL EXPLODED VIEWS I1-1, I1-2
CHASSIS EXPLODED VIEWS I2-1, I2-2
MECHANICAL REPLACEMENT PARTS LIST J1-1
CHASSIS REPLACEMENT PARTS LIST J2-1
ELECTRICAL REPLACEMENT PARTS LIST ..... J3-1~J3-3

GENERAL SPECIFICATIONS

G-1	TV System	CRT	CRT Size / Visual Size		10 inch / 222.8mmV
			CRT Type		Normal
			Deflection		90 degree
			Magnetic Field BV/BH		+0.45G/0.18G
		Color System			PAL
		Speaker			1Speaker
			Position		Side
			Size		3 inch
			Impedance		8 ohm
		Sound Output	MAX		1.2 W
			10%(Typical)		0.8 W
G-2	VCR System	System			VHS Player / Recorder
		Video System			PAL
		Hi-Fi STEREO			No
		NTSC PB			Yes
		Deck	DECK		OVD-6S
			Loading System		Front
			Motor		3
		Heads	Video Head		2 Head
			FM Audio Head		No
			Audio /Control		Mono / Yes
			Erase(Full Track Erase)		Yes
		Tape Speed	Rec PAL		SP
			Rec NTSC		-
			Play PAL		SP
			Play NTSC		SP
		Fast Forward / Rewind Time (Approx.) at+25oC			FF:1'48"/REW:1'48"
			Cassette		at E-180
		Forward/Reverse	NTSC or PAL-M		SP=3x,5x
		Picture Search	PAL or SECAM		SP=5x,7x
		Frame Advance			1/10
		Slow Speed			1/5~1/30
G-3	Tuning System	Broadcasting System			CCIR System B/G
		Tuner and Receive CH	System		1Tuner
			Destination		CCIR Hyper
			Tuning System		F-Synth
			Input Impedance		VHF/UHF 75 ohm
			CH Coverage		E2~E4, X~Z+2, S1~S10, E5~E12,S11~S41,E21~E69
		Intermediate Frequency	Picture(FP)		38.9MHz
			Sound(FS)		33.4MHz
			FP-FS		5.5MHZ
		Preset CH			80CH
		Stereo/Dual TV Sound			No
G-4	Signal	Video Signal	Input Level		1 V p-p/75 ohm
			Output Level		1 V p-p/75 ohm
			S/N Ratio (Weighted)		53 dB
			Horizontal Resolution at SP Mode		240 Lines
		Audio Signal	Input Level		-3.8dBm/50Kohm
			Output Level		-3.8dBm/1Kohm
			S/N Ratio at SP		42 dB
			Harmonic Distortion at SP (1KHz)	Typical	1.5 %
			Frequency Response	at SP	100Hz ~10kHz
				at LP	-
				at SLP	-
		Hi-Fi Audio Signal	Dynamic Range : More than		-
			Wow And Flutter : Less than		-
			Channel Separation : More than		-
			Harmonic Distortion : Less than		-
G-5	Power	Power Source	AC		230V 50Hz
			DC		12V
		Power Consumption		at AC	50 W at 230 V 50 Hz
				at DC	50 W at 12 V
			Stand by (at AC)		6 W at 230 V 50 Hz
			Per Year		-
		Protector	Power Fuse		Yes
			Dew Sensor		Yes
G-6	Regulation		Safety		CE
			Radiation		CE
			X-Radiation		PTB
G-7	Temperature		Operation		+5°C ~ +40°C
			Storage		-20°C ~ +60°C
G-8	Operating Humidity				Less then 80% RH
G-9	On Screen Display	Menu			Yes
		Menu	Type		Character

GENERAL SPECIFICATIONS

		ATS			No
		Timer Rec Set			Yes
		Channel Setup			Yes
			Auto Tuning		Yes
			Ch Mapping		No
			Ch Tuning		Yes
			Ch Allocation		Yes
		TV Setup			Yes
			On/Off Timer Set		Yes
			Picture		Yes
			Audio		No
		VCR Setup			No
			Auto Repeat On/Off		Yes
			System Select		No
			Scene Repeat		No
		System Setup			Yes
			Clock Set		Yes (Calendar 24h)
			Language		Yes
		G-CODE(or SHOWVIEW or PLUSCODE)No. Entry			No
		Stereo/Audio Output			No
			Bilingal		No
			NICAM		No
		Clock/Date			Yes
		CH/AV			Yes
		Tape Counter(Linear Counter)			Yes
		Tape Speed			No
		Sleep Time			Yes
		Control Level	Volume		Yes
			Bright / Contrast / Sharpness/ Color		Yes
			Tint		No
			Bass/Treble/Balance		No
			Manual Tracking		Yes
		Play/Stop/FF/Rew/Rec/OTR/T-Rec/Pause/Eject/Tape In (Symbol Mark)			Yes
		Auto Tracking/Manual Tracking			Yes
		S-Repeat/SR-R/SR-PLAY			No
		Index			Yes
		Mute			Yes
		Hi-Fi			No
		Repeat			Yes
		Zero Return			No
		Dew			Yes
G-10	**OSD Language**				Eng Ger Fre Spa Ita
G-11	**Clock,Timer and Timer Back-up**	Calendar			1990/1/1 ~ 2081/12/31
		Timer Events			8 prog/ 1 month
		One Touch Recording Max Time			SP 5 Hours
		OTPB Valid Time			-
		Sleep Timer	Max Time		120 min.
			Step		10 min.
		On/Off Timer	Program(On Tim / Off Tim)		1 prog.
		Auto Shut Off	No Signal		15 min.
			No Operation		- min.
		Timer Back-up (at Power Off Mode)			30 min.
G-12	**Remote Control**	Unit			RC-CH
		Glow in Dark Remocon			No
		Power Source	Voltage(D.C)		3V
			UM size x pcs		UM-4 x 2 pcs
		Total Keys			36 Keys
		Keys	Power		Yes
			1		Yes
			2		Yes
			3		Yes
			4		Yes
			5		Yes
			6		Yes
			7		Yes
			8		Yes
			9		Yes
			0/AV		Yes
			CH/Tr Up		No
			CH/Tr Up/Page Up		Yes
			CH/Tr Down		No
			CH/Tr Down /Page Down		Yes
			Volume Up		Yes
			Volume Down		Yes
			Play/Up		No
			Play/Up/Slow		Yes
			F.Fwd/Right		Yes

GENERAL SPECIFICATIONS

			Rew/Left	Yes
			Pause/Still	Yes
			Pause	No
			Stop/Down	Yes
			Rec/OTR	Yes
			Eject	Yes
			Counter Reset	Yes
			Speed	No
			Timer Rec	Yes
			TV Monitor	Yes
			TV Monitor /Rec Monitor	No
			Program	Yes
			Program /V+	No
			Auto Tracking	No
			Auto Tracking /Reveal	Yes
			Menu	Yes
			Enter	No
			Enter/Hold	Yes
			Cancel/Ch Skip	No
			Cancel/Ch Skip/F-T-B	Yes
			Index	No
			Index /Sub Page	Yes
			Call	Yes
			Text/Mix/TV	Yes
			Sleep Timer	Yes
			Mute	Yes
			Zero Return	Yes
			CM Skip	No
			OTPB	No
			END Call	No
			Red	No
			Cyan	No
			Green	No
			Yellow	No
			Audio Select	No
G-13	Features	Auto Head Cleaning		Yes
		Auto Tracking		Yes
		HQ (VHS Standard High Quality)		Yes
		Auto Power On, Auto Play, Auto Rewind, Auto Eject		Yes
		Auto Shut Off		Yes
		Auto Repeat		Yes
		VIDEO PLUS+(SHOWVIEW,G-CODE)		No
		CH Auto Set-Up/Auto Clock		No
		Forward / Reverse Picture Search		No
		One Touch Playback		No
		Auto Tuning		Yes
		Anti-Theft		No
		End Call		No
		Index Search		Yes
		SQPB		No
		CATV		No
		CM Skip(30sec x 6 Times)		No
		Comb Filter		No
		T'Text		Yes
			Text type	UniText
		Scene Repeat		No
		Hotel Lock		No
		TV Monitor		Yes
		Zero Return		Yes
		Choke Coil		No
		Power On Memory		No
G-14	Accessories	Owner's Manual	Language	German
			w/Guarantee Card	Yes
		Remote Control Unit		Yes
		Rod Antenna		Yes
			Poles	2pole
			Terminal	DIN type
			w/300 ohm to 75 ohm Antenna Adapter	Yes
		Loop Antenna		No
			Terminal	-
		U/V Mixer		No
		DC Car Cord (Center+)		Yes
		Guarantee Card		No
		Warning Sheet		No
		Circuit Diagram		No
		Antenna Change Plug		No
		Service Facility List		No

GENERAL SPECIFICATIONS

		Important Safeguard			No
		Dew/AHC Caution Sheet			No
		AC Plug Adapter			No
		Quick Set-up Sheet			Yes
		Battery			Yes
				UM size x pcs	UM-4 x 2 pcs
				OEM Brand	No
		AC Cord			No
		AV Cord (2Pin-1Pin)			No
		21pin-RCA Cable			No
		Registration Card			No
		PTB Sheet			No
		Anti-Theft Sheet			No
		Euro Warranty Information Sheet			No
G-15	Interface	Switch	Front	Power	Yes
				Play	Yes
				Pause/Still	No
				System Select	No
				One Touch Playback	No
				Channel Up	Yes
				Channel Down	Yes
				F.FWD/Cue	Yes
				Eject/Stop	Yes
				Main Power SW	No
				Volume Up	Yes
				Volume Down	Yes
				Rew/Rev	Yes
				Rec/OTR	Yes
			Rear	Main Power SW	Yes
		Indicator		Standby	Red
				Rec/OTR	Red
				T-Rec	Red
				On Timer	No
				CS	No
		Key Light up		Rec/OTR	No
				One Touch Playback	No
				Play	No
		Terminals	Front	Video Input	RCA x1
				Audio Input	RCA x1
				Other Terminal	Head Phone(Stereo & Mono, 3.5mm)
			Rear	Video Input	No
				Audio Input	No
				Video Output	No
				Audio Output	No
				Euro Scart	1-SCART
				Diversity	No
				Ext Speaker	No
				DC Jack 12V(Center +)	Yes
				VHF/UHF Antenna Input	DIN type
				AC Inlet	No
G-16	Set Size			Approx. W x D x H (mm)	278 x 312.5 x 311.5
G-17	Weight			Net (Approx.)	8.8 kg (- lbs)
				Gross (Approx.)	10.5 kg (- lbs)
G-18	Carton		Master Carton		No
				Content	-
				Material	-
				Dimensions W x D x H(mm)	-
				Description of Origin	-
			Gift Box		Yes
				Material	Double/Full Color
				Dimensions W x D x H(mm)	338 x 381 x 386
				Design	As per Buyer's
				Description of Origin	No
			Drop Test	Natural Dropping At	1 Corner / 3 Edges / 6 Surfaces
				Height (cm)	62
			Container Stuffing(40' container)		1256 Sets
G-19	Cabinet Material			Cabinet Front	PS 94HB
				Cabinet Rear	PS 94HB
				Jack Panel	PS 94HB

DISASSEMBLY INSTRUCTIONS

1. REMOVAL OF MECHANICAL PARTS AND P.C. BOARDS

1-1: BACK CABINET (Refer to Fig. 1-1)

1. Remove the 4 screws ①.
2. Remove the 2 screws ②.
3. Remove the 2 screws ③ which are used for holding the Back Cabinet.
4. Remove the AC cord from the AC cord hook ④.
5. Remove the Back Cabinet in the direction of arrow.

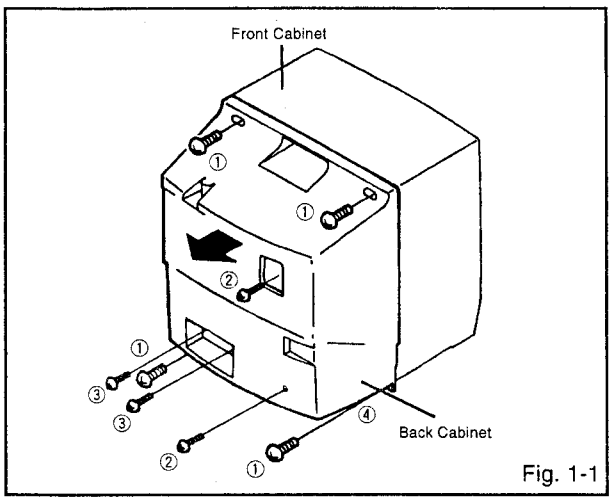


Fig. 1-1

1-2: CRT PCB (Refer to Fig. 1-2)

CAUTION: BEFORE REMOVING THE ANODE CAP, DISCHARGE ELECTRICITY BECAUSE IT CONTAINS HIGH VOLTAGE. BEFORE ATTEMPTING TO REMOVE OR REPAIR ANY PCB, UNPLUG THE POWER CORD FROM THE AC SOURCE.

1. Remove the Anode Cap. (Refer to REMOVAL OF ANODE CAP)
2. Disconnect the following connectors: (CP801 and CP850).
3. Remove the CRT PCB in the direction of arrow.

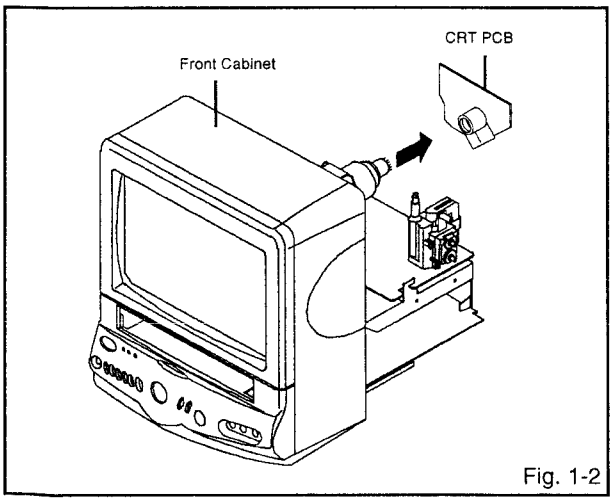


Fig. 1-2

1-3: TV/VCR BLOCK (Refer to Fig. 1-3)

1. Remove the 2 screws ①.
2. Disconnect the following connectors: (CP351, CP401, CP403 and CP501).
3. Unlock the support ②.
4. Remove the TV/VCR Block in the direction of arrow.

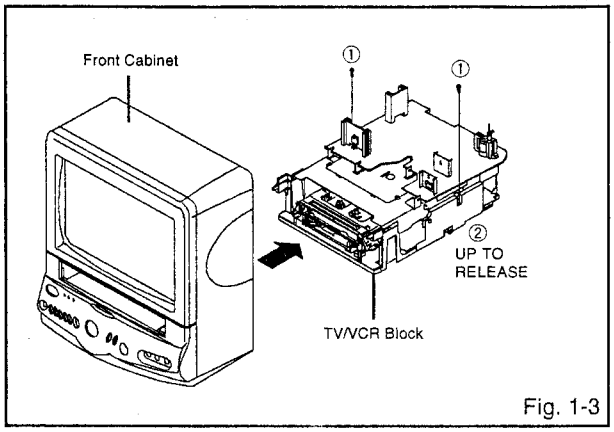


Fig. 1-3

1-4: MAIN PCB (Refer to Fig. 1-4)

1. Remove the screw ①.
2. Remove the Main PCB Holder.
3. Remove the 2 screws ②.
4. Remove the screw ③.
5. Disconnect the following connectors: (CP502 and CP820).
6. Remove the Main PCB in the direction of arrow.

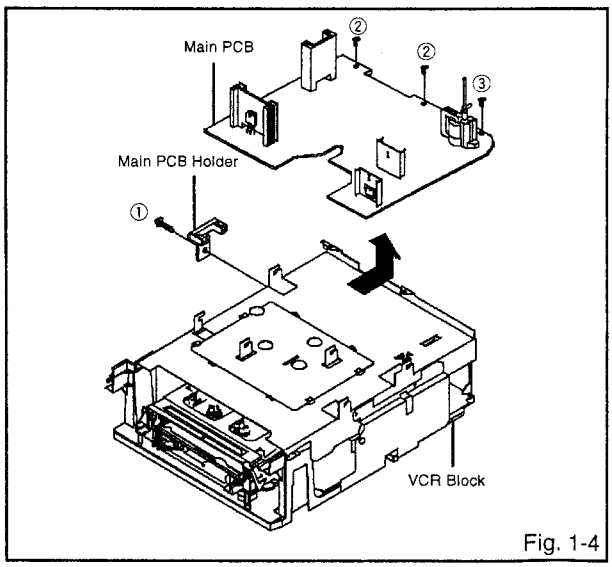


Fig. 1-4

DISASSEMBLY INSTRUCTIONS

1-5: DECK SHIELD PLATE (Refer to Fig. 1-5)

1. Remove the 2 screws ①.
2. Remove the 4 screws ②.
3. Remove the screw ③.
4. Remove the Deck Shield Plate in the direction of arrow (A).
5. Remove the screw ④.
6. Remove the Shield Plate Bottom in the direction of arrow (B).

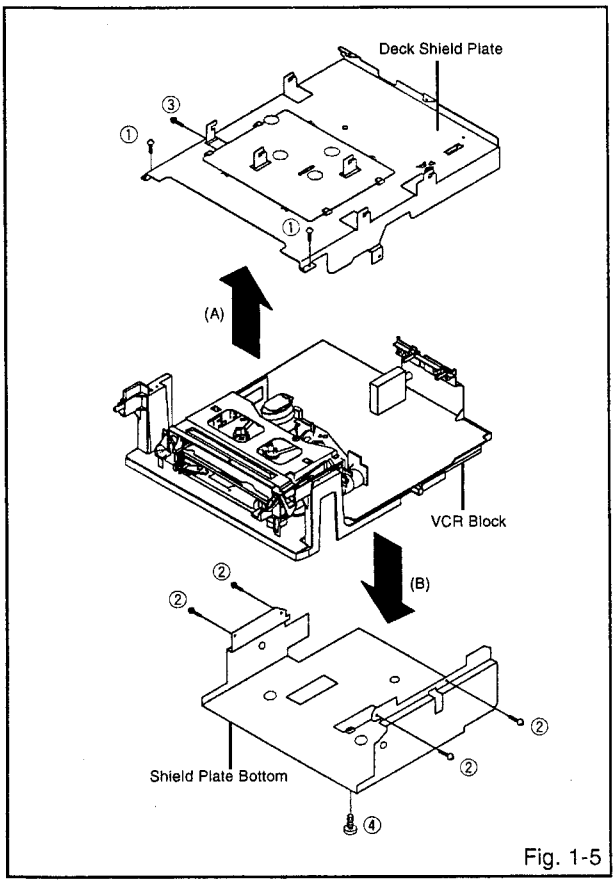


Fig. 1-5

1-6: DECK CHASSIS (Refer to Fig. 1-6)

1. Remove the 3 screws ①.
2. Disconnect the following connectors:
   (CP1001, CP1004, CP1005, CP1006, CP4001, CP4004 CP4005, CP4503 and CP4504).
3. Remove the Deck Chassis in the direction of arrow.

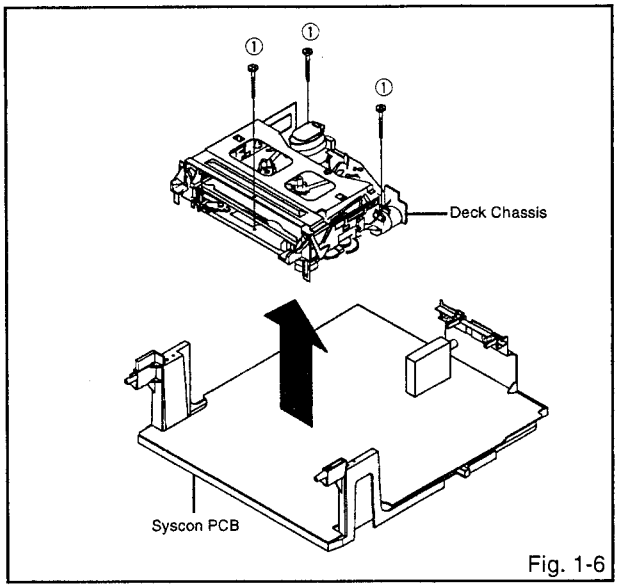


Fig. 1-6

1-7: JACK PLATE, 21PIN PCB AND SYSCON PCB (Refer to Fig. 1-7)

1. Remove the screw ①.
2. Remove the Syscon PCB in the direction of arrow (A).
3. Remove the 2 screws ②.
4. Unlock the 2 supports ③.
5. Remove the Jack Plate and 21Pin PCB in the direction of arrow (B).

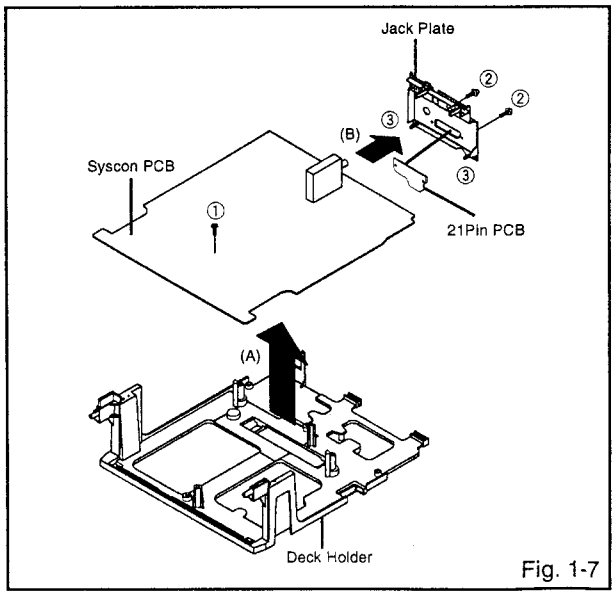


Fig. 1-7

DISASSEMBLY INSTRUCTIONS

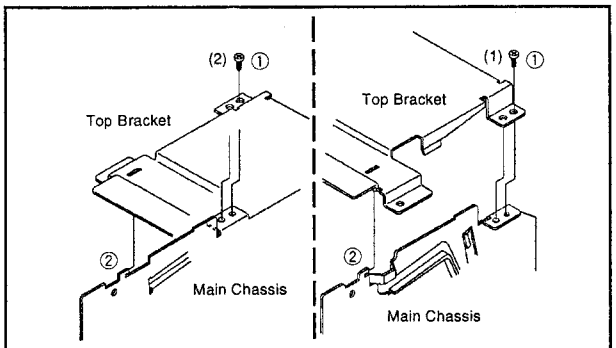
2. REMOVAL OF DECK PARTS

2-1: TOP BRACKET (Refer to Fig. 2-1)

1. Remove the 2 screws ①.
2. Slide the 2 supports ② and remove the Top Bracket.

NOTE

When you install the Top Bracket, install the screw (1) first, then install the screw (2).



• Screw Torque: 5 ± 0.5kgf•cm

Fig. 2-1

2-2: FLAP LEVER/TAPE GUIDE R (Refer to Fig. 2-2)

1. Move the Cassette Holder Ass'y to the back side.
2. Remove the Polyslider Washer ①.
3. Remove the Flap Lever.
4. Unlock the 3 supports ② and remove the Tape Guide R.

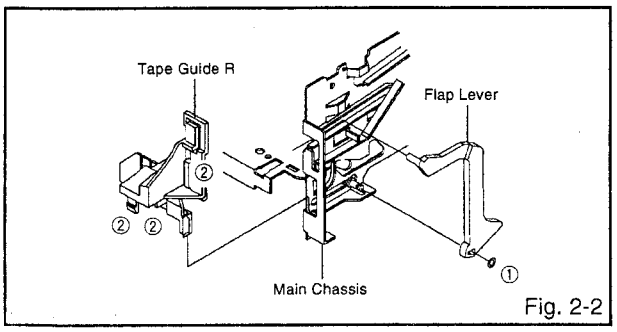
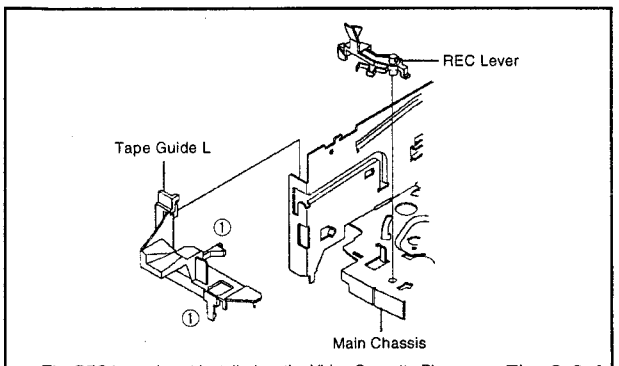


Fig. 2-2

2-3: TAPE GUIDE L (Refer to Fig. 2-3-A)

1. Move the Cassette Holder Ass'y to the back side.
2. Unlock the 2 supports ① and remove the Tape Guide L.
3. Remove the REC Lever. (Recorder only)

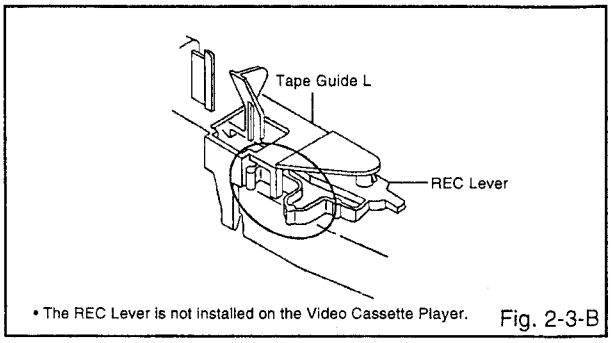


• The REC Lever is not installed on the Video Cassette Player.

Fig. 2-3-A

NOTE

When you install the Tape Guide L, install as shown in the circle of Fig. 2-3-B. **(Refer to Fig. 2-3-B)**



• The REC Lever is not installed on the Video Cassette Player.

Fig. 2-3-B

2-4: CASSETTE HOLDER ASS'Y (Refer to Fig. 2-4)

1. Move the Cassette Holder Ass'y to the front side so that the Link Ass'y doesn't slip out.
2. Push the Locker R to remove the Cassette Side R.
3. Remove the Cassette Side L.

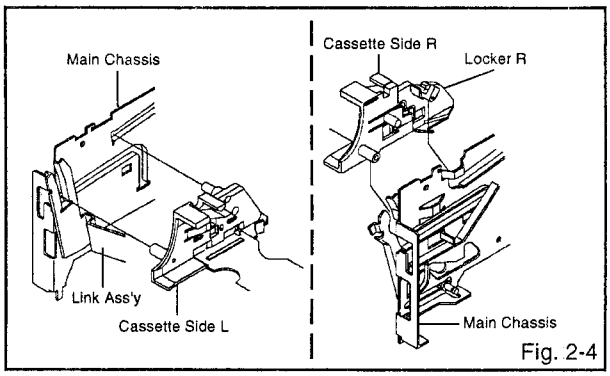


Fig. 2-4

2-5: CASSETTE SIDE L/R (Refer to Fig. 2-5)

1. Unlock the 4 supports ① and then remove the Cassette Side L/R.
2. Remove the Cassette Earth Spring.

NOTE

1. When you install the Cassette Side R, be sure to move the Locker R after installing.
2. After the installation of the Cassette Holder, then install the Cassette Earth Spring.

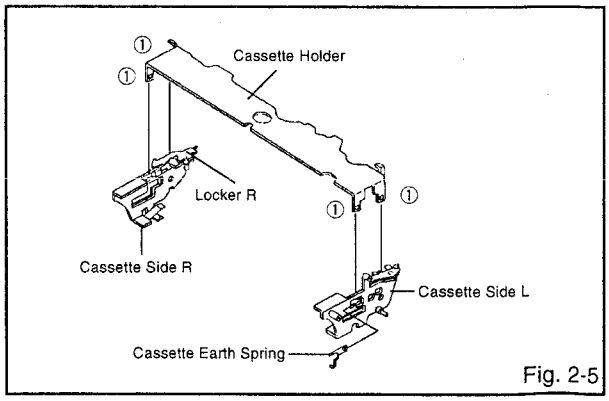


Fig. 2-5

DISASSEMBLY INSTRUCTIONS

2-6: LINK ASS'Y (Refer to Fig. 2-6)

1. Set the Link Ass'y to the Eject position.
2. Remove the (A) side of the Link Ass'y first, then remove the (B) side.

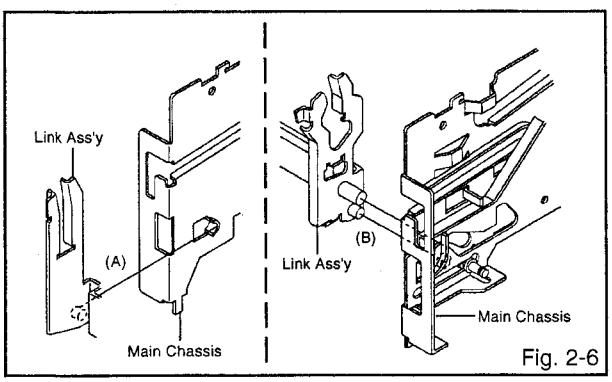


Fig. 2-6

2-7: LOADING MOTOR ASS'Y (Refer to Fig. 2-7)

1. Remove the Link Lever.
2. Remove the Dumper Spring.
3. Remove the 2 screws ①.
4. Unlock the support ② and remove the Loading Motor Ass'y.
5. Unlock the 2 supports ③ and remove the BOT PCB.

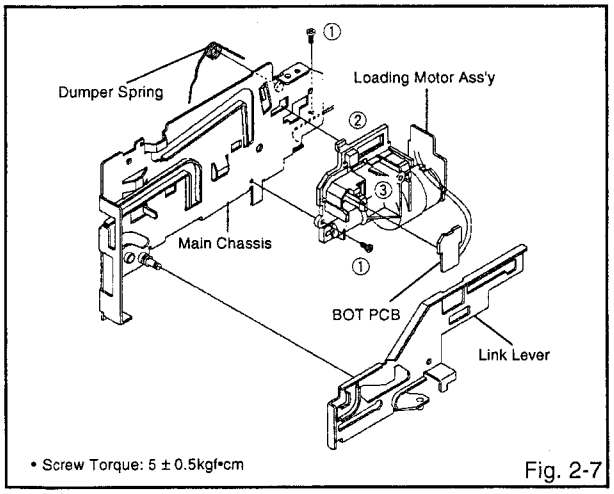


Fig. 2-7

2-8: SENSOR COVER L3 (Refer to Fig. 2-8)

1. Unlock the support ① and remove the Sensor Cover L3.

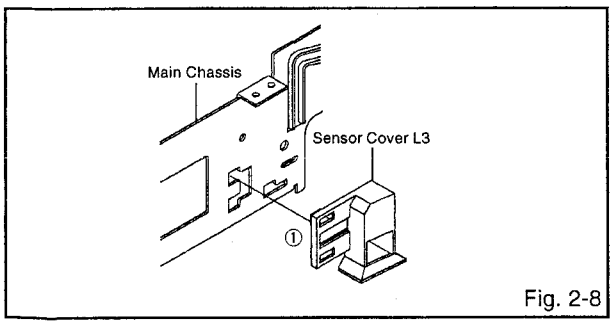


Fig. 2-8

2-9: TENSION ASS'Y (Refer to Fig. 2-9-B)

1. Turn the Middle Gear clockwise so that the Tension Holder hook, is set to the position of Fig. 2-9-A to more the Tension Arm Ass'y.
2. Remove the Tension Spring.
3. Unlock the support ① and remove the Tension Arm Ass'y.
4. Remove the Tension Adjust.
5. Unlock the 2 supports ② and remove the Tension Band Ass'y.
6. Float the hook ③ and turn it clockwise then remove the Tension Holder.
7. Remove the SS Brake Spring.
8. Remove the SS Arm Brake.

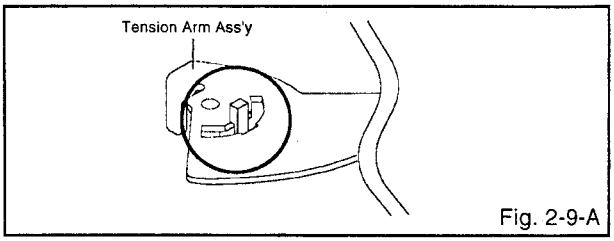


Fig. 2-9-A

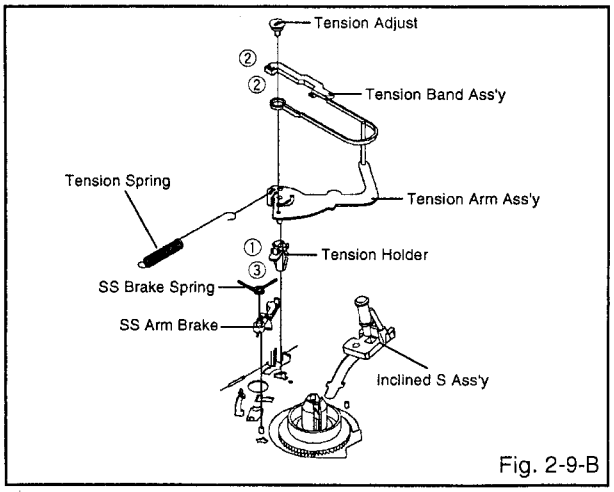


Fig. 2-9-B

NOTE

When you install the Tension Adjust, install as shown in Fig. 2-9-C. **(Refer to Fig. 2-9-C)**

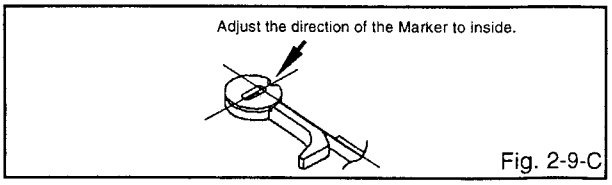


Fig. 2-9-C

DISASSEMBLY INSTRUCTIONS

2-10: T BRAKE ASS'Y (Refer to Fig. 2-10)

1. Remove the T Brake Spring.
2. Turn the T Brake Ass'y clockwise and bend the hook section to remove it.

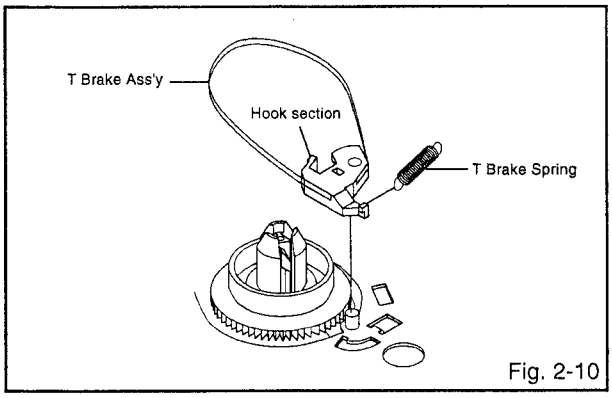


Fig. 2-10

2-11: S REEL/T REEL (Refer to Fig. 2-11)

1. Remove the S Reel and T Reel.
2. Remove the 2 Polyslider Washers ①.

NOTE

1. Take care not to damage the gears of the S Reel and T Reel.
2. The Polyslider Washer may be remained on the back of the reel.
3. Take care not to damage the shaft.
4. Do not touch the section "A" of S Reel and T Reel. (Use gloves.) **(Refer to Fig. 2-11)** Do not adhere the stains on it.
5. When you install the reel, clean the shaft and oil it (FL OIL #6115). (If you do not oil, noise may be heard in FF/REW mode.)
6. After installing the reel, adjust the height of the reel. **(Refer to MECHANICAL ADJUSTMENT)**

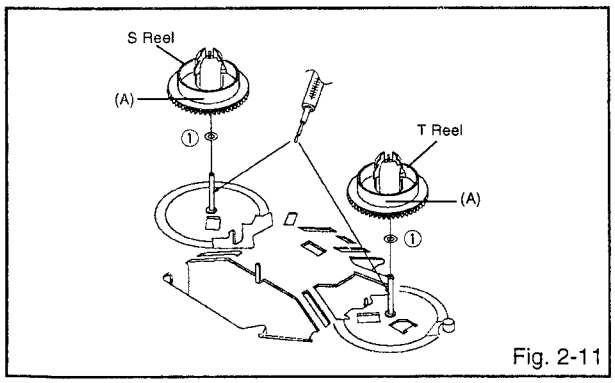


Fig. 2-11

2-12: PINCH ROLLER BLOCK/P5-3 ARM ASS'Y (Refer to Fig. 2-12-A)

1. Remove the P5 Spring.
2. Remove the screw ①.
3. Unlock the 2 supports ② and remove the Cassette Opener.
4. Remove the Pinch Roller Block, Pinch Roller Arm Spring, Pinch Roller Lever Ass'y and P5-3 Arm Ass'y.

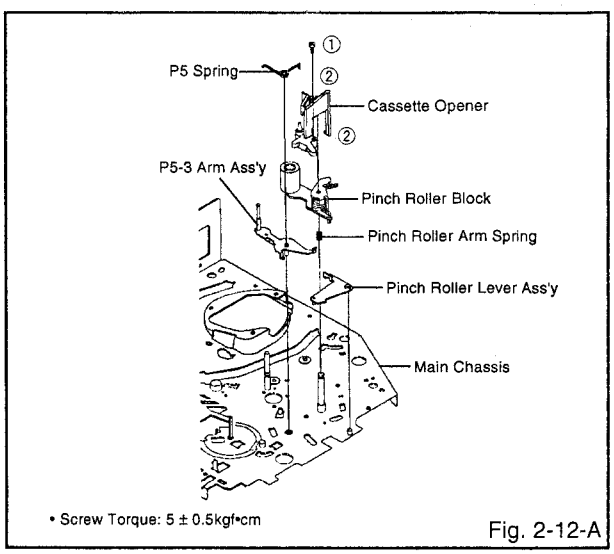


Fig. 2-12-A

NOTE

1. Do not touch the Pinch Roller. (Use gloves.)
2. When you install the Pinch Roller Block, install as shown in the circle of Fig. 2-12-B. **(Refer to Fig. 2-12-B)**

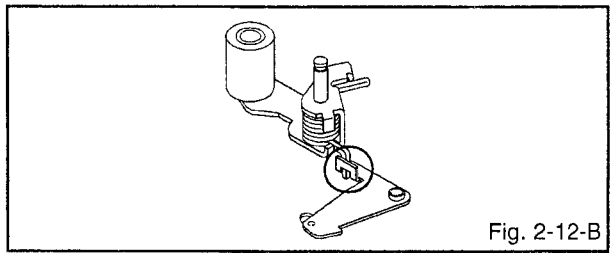


Fig. 2-12-B

2-13: A/C HEAD (Refer to Fig. 2-13-A)

1. Remove the screw ①.
2. Remove the A/C Head Base.
3. Remove the 3 screws ②.
4. Remove the A/C Head and A/C Head Spring.

NOTE

1. Do not touch the A/C Head. (Use gloves.)
2. When you install the A/C Head Spring, install as shown in Fig. 2-13-B. **(Refer to Fig. 2-13-B)**
3. When you install the A/C Head, tighten the screw (1) first, then tighten the screw (2), finally tighten the screw (3).

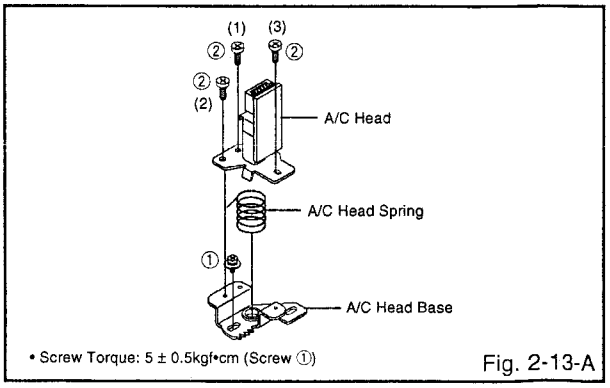


Fig. 2-13-A

DISASSEMBLY INSTRUCTIONS

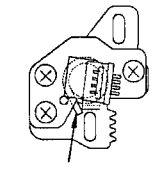
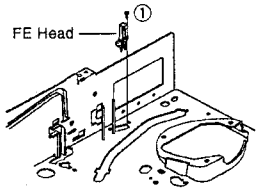


Fig. 2-13-B

2-14: FE HEAD (RECORDER ONLY) (Refer to Fig. 2-14)

1. Remove the screw ①.
2. Remove the FE Head.



• The FE Head is not installed on the Video Cassette Player.
• Screw Torque: 4 ± 0.5kgf•cm

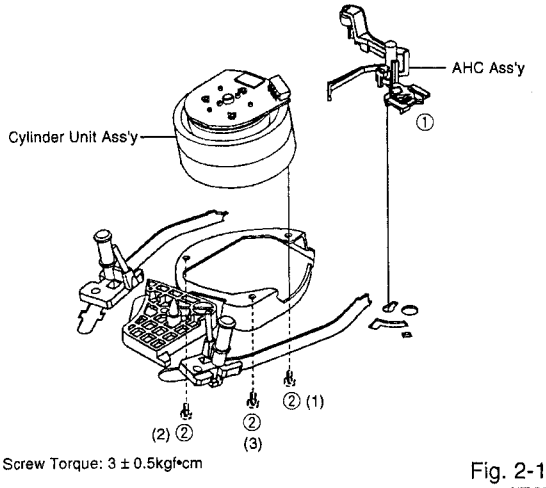
Fig. 2-14

2-15: AHC ASS'Y/CYLINDER UNIT ASS'Y (Refer to Fig. 2-15)

1. Unlock the support ① and remove the AHC Ass'y.
2. Remove the 3 screws ②.
3. Remove the Cylinder Unit Ass'y.

NOTE

When you install the Cylinder Unit Ass'y, tighten the screws from (1) to (3) in order while pulling the Ass'y toward the left front direction.

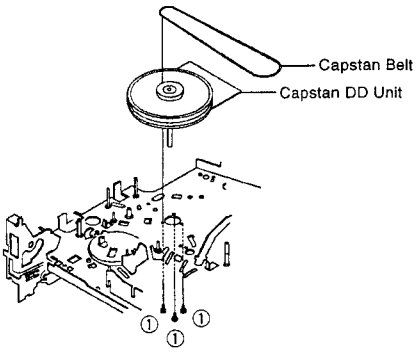


• Screw Torque: 3 ± 0.5kgf•cm

Fig. 2-15

2-16: CAPSTAN DD UNIT (Refer to Fig. 2-16)

1. Remove the Capstan Belt.
2. Remove the 3 screws ①.
3. Remove the Capstan DD Unit.



• Screw Torque: 5 ± 0.5kgf•cm

Fig. 2-16

2-17: MIDDLE GEAR/MAIN CAM (Refer to Fig. 2-17-A)

1. Remove the Polyslider Washer ①, then remove the Middle Gear.
2. Remove the E-Ring, then remove the Main Cam, P5 Cam and Pinch Roller Cam.
3. Remove the Polyslider Washer ②, then remove the Joint Gear.

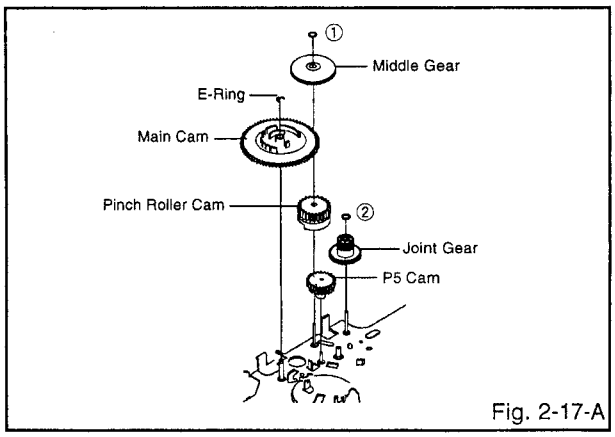


Fig. 2-17-A

NOTE

When you install the Pinch Roller Cam, P5 Cam and Main Cam, align each marker. **(Refer to Fig. 2-17-B)**

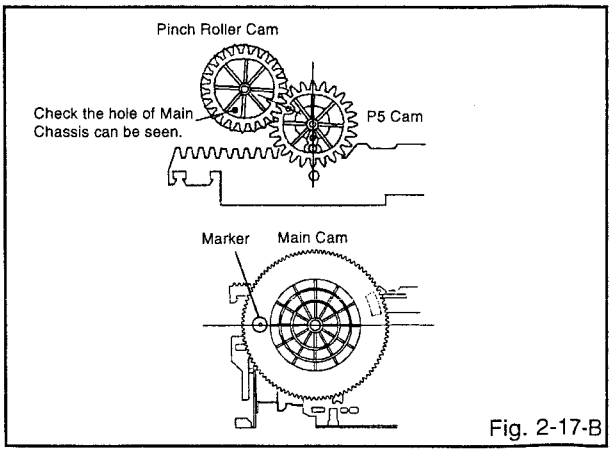


Fig. 2-17-B

DISASSEMBLY INSTRUCTIONS

2-18: CLUTCH ASS'Y (Refer to Fig. 2-18)

1. Remove the Capstan Brake Spring.
2. Remove the Polyslider Washer ①.
3. Remove the Clutch Ass'y, Ring Spring and Coupling Gear.
4. Unlock the 2 supports ② and remove the Clutch Lever.

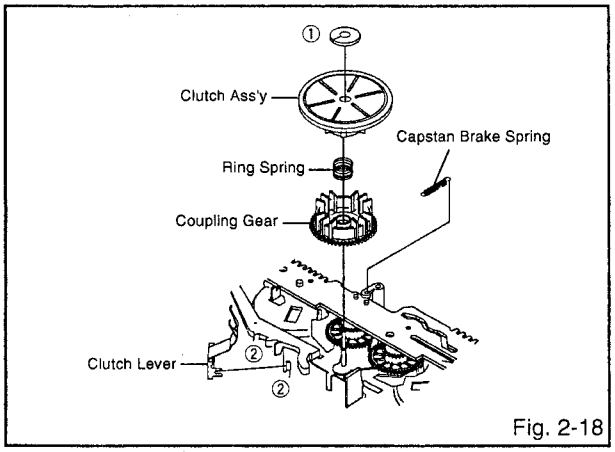


Fig. 2-18

2-19: LOADING GEAR S/T ASS'Y (Refer to Fig. 2-19-A)

1. Remove the E-Ring ① and remove the Main Loading Gear.
2. Slide the Main Rod and remove the Capstan Brake Ass'y.
3. Remove the Main Rod, Tension Lever, Clutch Actuator, Idler Arm Ass'y.
4. Remove the screw ②.
5. Remove the LED Reflecter.
6. Remove the Loading Arm S Ass'y and Loading Arm T Ass'y.
7. Remove the Loading Gear S and Loading Gear T.
8. Remove the Loading Gear Spring.

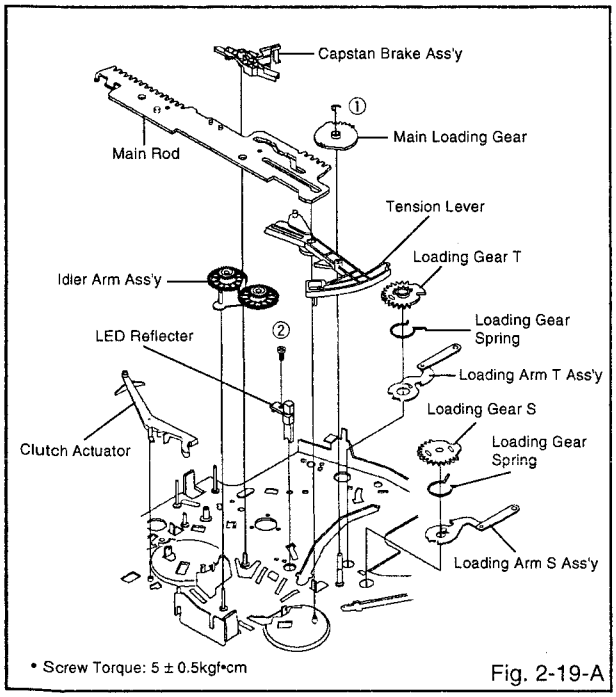


Fig. 2-19-A

NOTES

1. When you install the Loading Arm S Ass'y, Loading Arm T Ass'y and Main Loading Gear, align each marker. **(Refer to Fig. 2-19-B)**

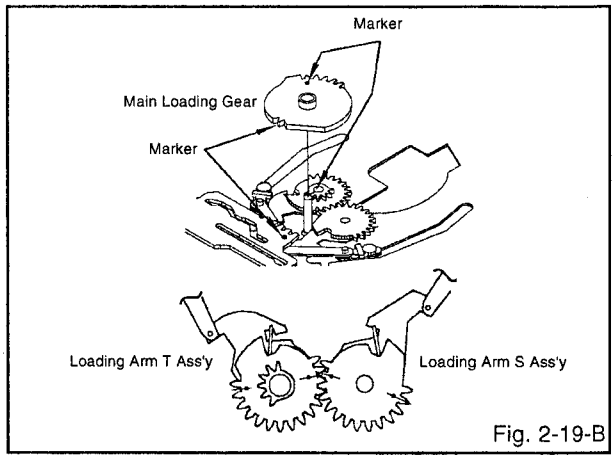


Fig. 2-19-B

2. When you install the Clutch Actuator, install as shown in the circle of Fig. 2-19-C. **(Refer to Fig. 2-19-C)**

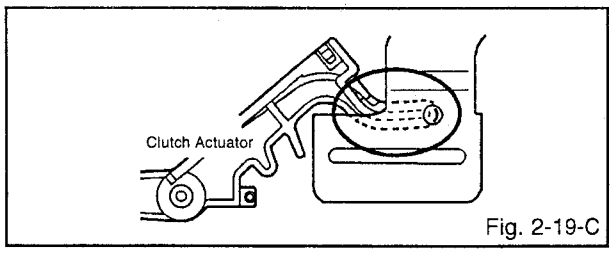


Fig. 2-19-C

2-20: INCLINED S/T ASS'Y (Refer to Fig. 2-20)

1. Unlock the support ① and remove the P4 Cover.
2. Remove the screw ②.
3. Unlock the support ③ and remove the Loading Gear Holder.
4. Remove the Inclined S.
5. Remove the Inclined T.
6. Remove the 2 screws ④, then remove the Guide Roller.

NOTE

Do not touch the roller of Guide Roller.

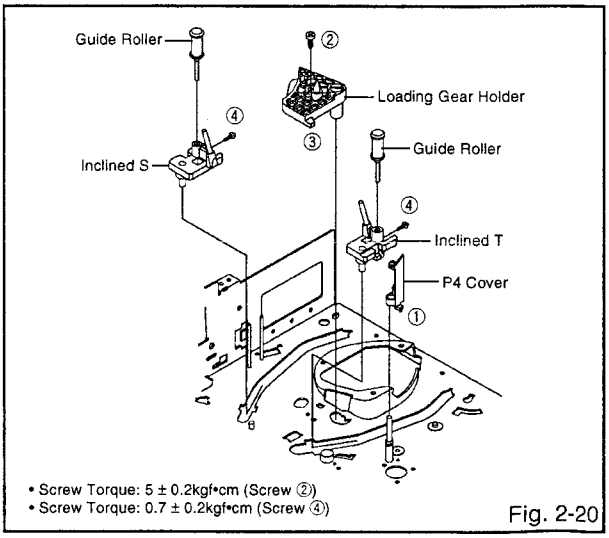


Fig. 2-20

DISASSEMBLY INSTRUCTIONS

3. REMOVAL OF ANODE CAP

Read the following **NOTED** items before starting work.

* After turning the power off there might still be a potential voltage that is very dangerous. When removing the Anode Cap, make sure to discharge the Anode Cap's potential voltage.
* Do not use pliers to loosen or tighten the Anode Cap terminal, this may cause the spring to be damaged.

REMOVAL

1. Follow the steps as follows to discharge the Anode Cap. **(Refer to Fig. 3-1.)**
   Connect one end of an Alligator Clip to the metal part of a flat-blade screwdriver and the other end to ground.
   While holding the plastic part of the insulated Screwdriver, touch the support of the Anode with the tip of the Screwdriver.
   A cracking noise will be heard as the voltage is discharged.

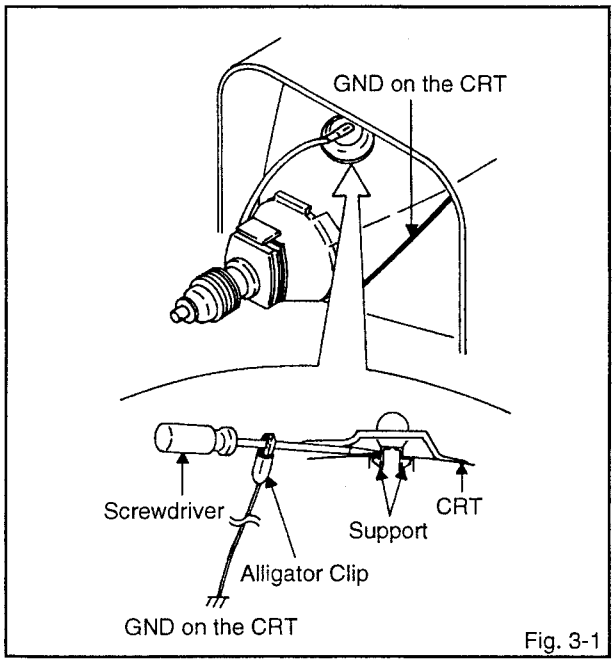


Fig. 3-1

2. Flip up the sides of the Rubber Cap in the direction of the arrow and remove one side of the support. **(Refer to Fig. 3-2.)**

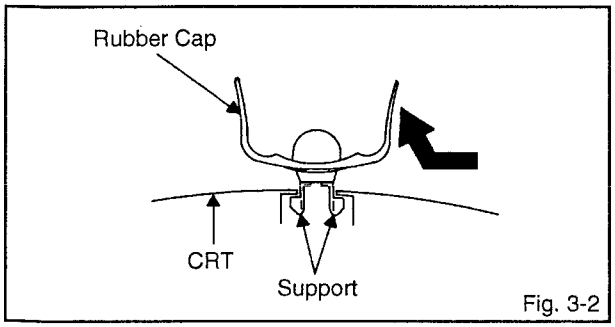


Fig. 3-2

3. After one side is removed, pull in the opposite direction to remove the other.

NOTE

Take care not to damage the Rubber Cap.

INSTALLATION

1. Clean the spot where the cap was located with a small amount of alcohol. **(Refer to Fig. 3-3.)**

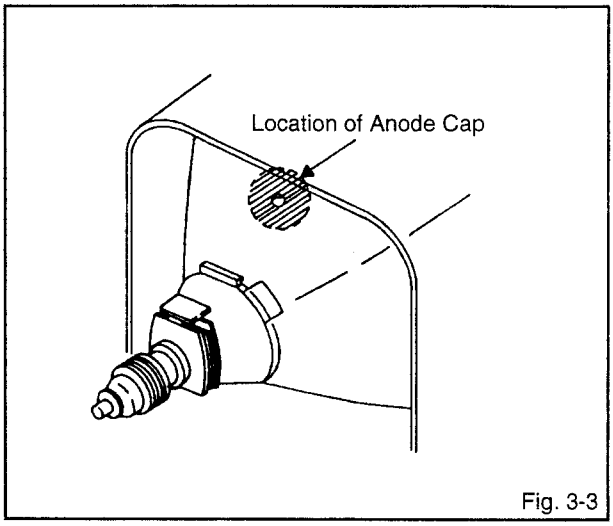


Fig. 3-3

NOTE

Confirm that there is no dirt, dust, etc. at the spot where the cap was located.

2. Arrange the wire of the Anode Cap and make sure the wire is not twisted.
3. Turn over the Rubber Cap. **(Refer to Fig. 3-4.)**

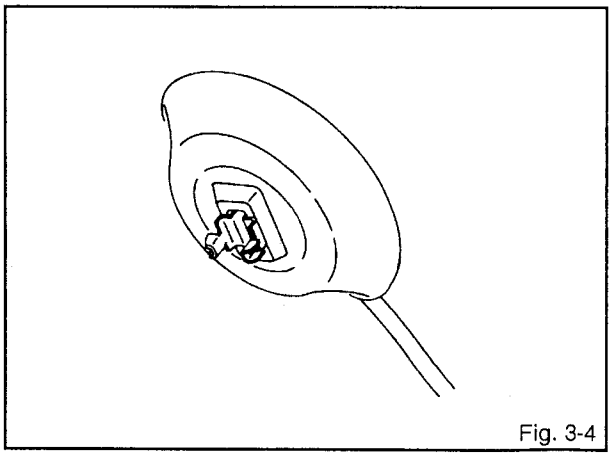


Fig. 3-4

4. Insert one end of the Anode Support into the anode button, then the other as shown in **Fig. 3-5**.

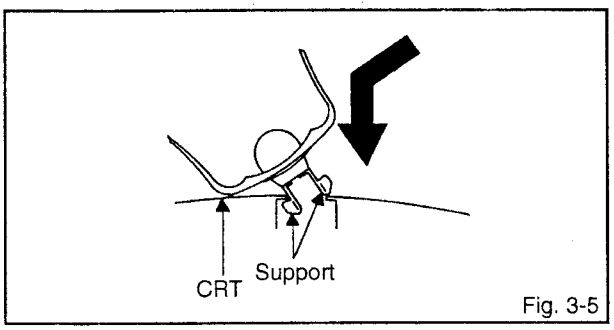


Fig. 3-5

5. Confirm that the Support is securely connected.
6. Put on the Rubber Cap without moving any parts.

4. REMOVAL OF DEFLECTION YOKE

(Refer to Fig. 4-1)

1. Loosen the screw ①.
2. Remove the Convergence • Purity Magnet in the direction of arrow.
3. Remove the 3 Wedges.
4. Remove the Deflection Yoke in the direction of arrow.

INSTALLATION

Install new Deflection Yoke in reverse steps of REMOVAL.

NOTE

After adjusting the purity and the convergence, fix the screw ① and lock the wedges.

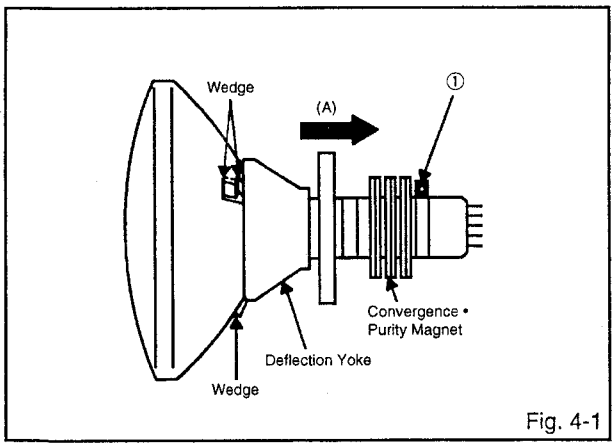


Fig. 4-1

DISASSEMBLY INSTRUCTIONS

5. REMOVAL AND INSTALLATION OF FLAT PACKAGE IC

REMOVAL

1. Put the Masking Tape (cotton tape) around the Flat Package IC to protect other parts from any damage. **(Refer to Fig. 5-1.)**

   NOTE

   Masking is carried out on all the parts located within 10 mm distance from IC leads.

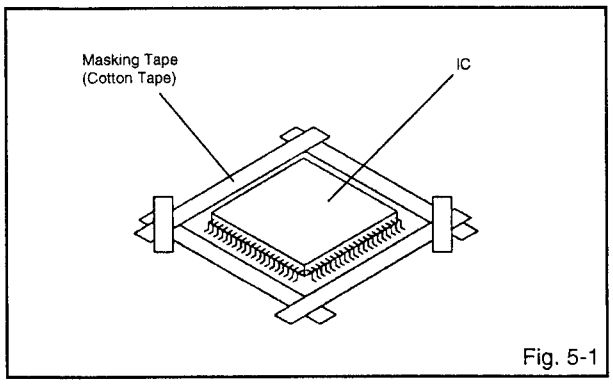


Fig. 5-1

2. Heat the IC leads using a blower type IC desoldering machine. **(Refer to Fig. 5-2.)**

   NOTE

   Do not add the rotating and the back and forth directions force on the IC, until IC can move back and forth easily after desoldering the IC leads completely.

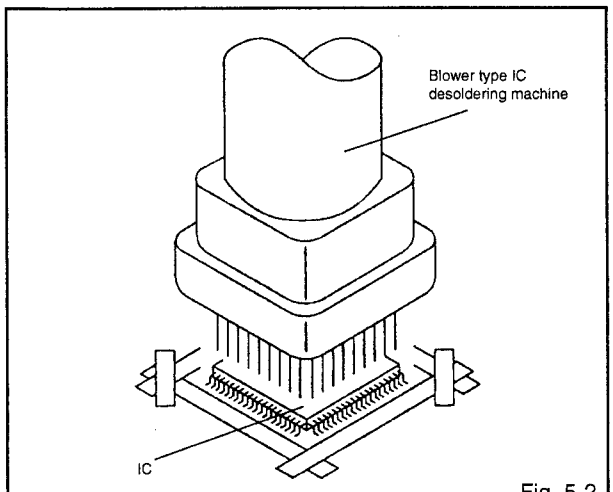


Fig. 5-2

3. When IC starts moving back and forth easily after desoldering completely, pickup the corner of the IC using a tweezers and remove the IC by moving with the IC desoldering machine. **(Refer to Fig. 5-3.)**

   NOTE

   Some ICs on the PCB are affixed with glue, so be careful not to break or damage the foil of each IC leads or solder lands under the IC when removing it.

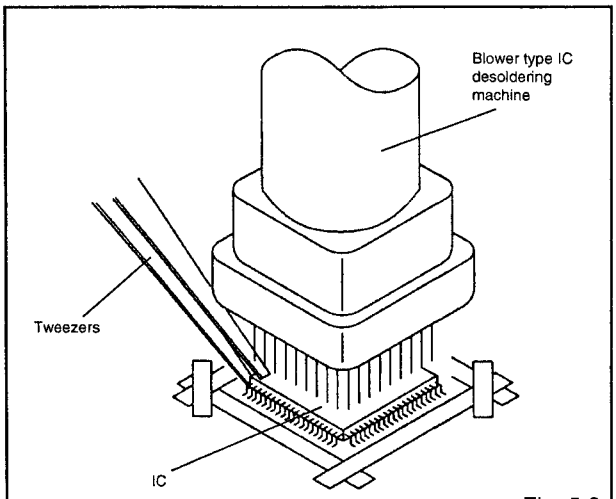


Fig. 5-3

4. Peel off the Masking Tape.
5. Absorb the solder left on the pattern using the Braided Shield Wire. **(Refer to Fig. 5-4.)**

   NOTE

   Do not move the Braided Shield Wire in the vertical direction towards the IC pattern.

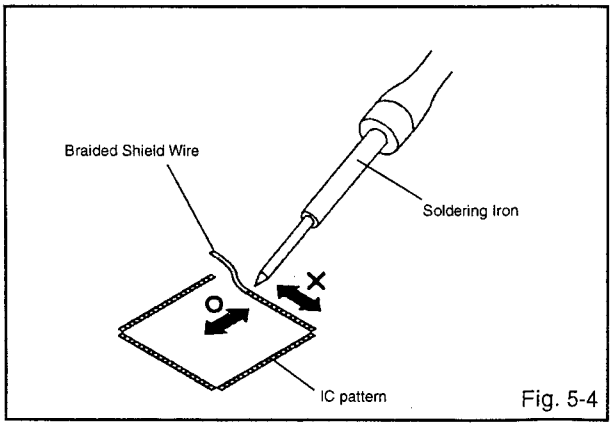


Fig. 5-4

DISASSEMBLY INSTRUCTIONS

INSTALLATION

1. Take care of the polarity of new IC and then install the new IC fitting on the printed circuit pattern. Then solder each lead on the diagonal positions of IC temporarily. **(Refer to Fig. 5-5.)**

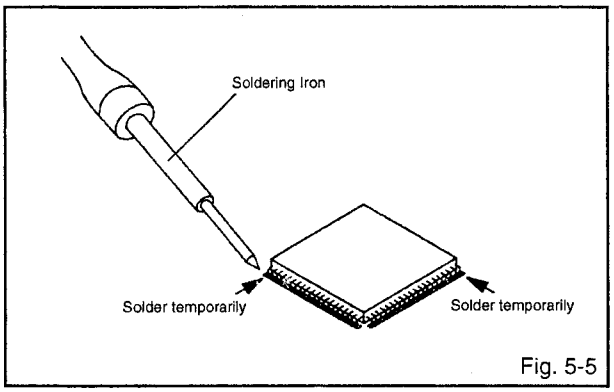


Fig. 5-5

2. Supply the solder from the upper position of IC leads sliding to the lower position of the IC leads. **(Refer to Fig. 5-6.)**

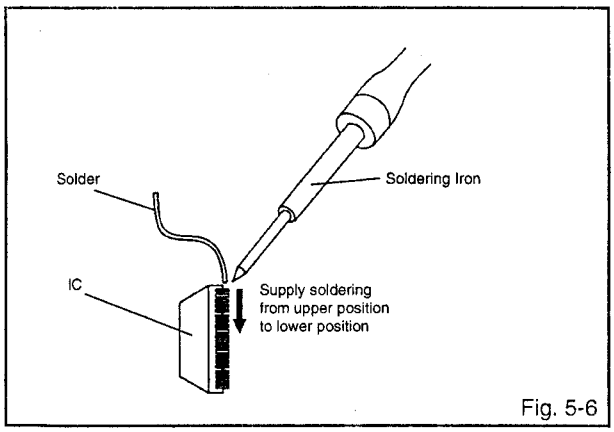


Fig. 5-6

3. Absorb the solder left on the lead using the Braided Shield Wire. **(Refer to Fig. 5-7.)**

   NOTE

   Do not absorb the solder to excess.

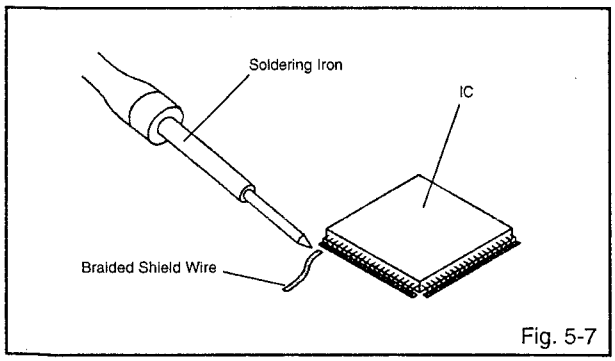


Fig. 5-7

4. When bridge-soldering between terminals and/or the soldering amount are not enough, resolder using a Thin-tip Soldering Iron. **(Refer to Fig. 5-8.)**

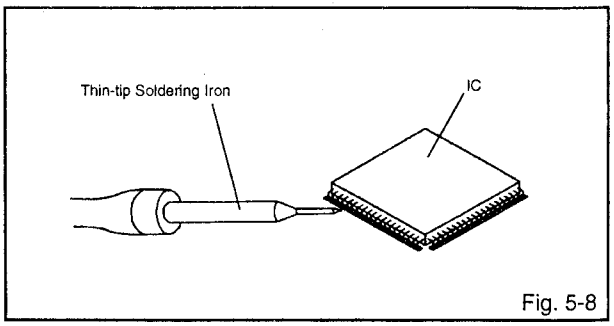


Fig. 5-8

5. Finally, confirm the soldering status on four sides of the IC using a magnifying glass.
   Confirm that no abnormality is found on the soldering position and installation position of the parts around the IC. If some abnormality is found, correct by resoldering.

   NOTE

   When the IC leads are bent during soldering and/or repairing, do not repair the bending of leads. If the bending of leads are repaired, the pattern may be damaged. So, be always sure to replace the IC in this case.

KEY TO ABBREVIATIONS

A	A/C	:	Audio/Control
	ACC	:	Automatic Color Control
	AE	:	Audio Erase
	AFC	:	Automatic Frequency Control
	AFT	:	Automatic Fine Tuning
	AFT DET	:	Automatic Fine Tuning Detect
	AGC	:	Automatic Gain Control
	AMP	:	Amplifier
	ANT	:	Antenna
	A.PB	:	Audio Playback
	APC	:	Automatic Phase Control
	ASS'Y	:	Assembly
	AT	:	All Time
	AUTO	:	Automatic
	A/V	:	Audio/Video
B	BGP	:	Burst Gate Pulse
	BOT	:	Beginning of Tape
	BPF	:	Bandpass Filter
	BRAKE SOL	:	Brake Solenoid
	BUFF	:	Buffer
	B/W	:	Black and White
C	C	:	Capacitance, Collector
	CASE	:	Cassette
	CAP	:	Capstan
	CARR	:	Carrier
	CH	:	Channel
	CLK	:	Clock
	CLOCK (SY-SE)	:	Clock (Syscon to Servo)
	COMB	:	Combination, Comb Filter
	CONV	:	Converter
	CPM	:	Capstan Motor
	CTL	:	Control
	CYL	:	Cylinder
	CYL-M	:	Cylinder-Motor
	CYL SENS	:	Cylinder-Sensor
D	DATA (SY-CE)	:	Data (Syscon to Servo)
	dB	:	Decibel
	DC	:	Direct Current
	DD Unit	:	Direct Drive Motor Unit
	DEMOD	:	Demodulator
	DET	:	Detector
	DEV	:	Deviation
E	E	:	Emitter
	EF	:	Emitter Follower
	EMPH	:	Emphasis
	ENC	:	Encoder
	ENV	:	Envelope
	EOT	:	End of Tape
	EQ	:	Equalizer
	EXT	:	External
F	F	:	Fuse
	FBC	:	Feed Back Clamp
	FE	:	Full Erase
	FF	:	Fast Forward, Flipflop
	FG	:	Frequency Generator
	FL SW	:	Front Loading Switch
	FM	:	Frequency Modulation
	FSC	:	Frequency Sub Carrier
	FWD	:	Forward
G	GEN	:	Generator
	GND	:	Ground
H	H.P.F	:	High Pass Filter
	H.SW	:	Head Switch
	Hz	:	Hertz
I	IC	:	Integrated Circuit
	IF	:	Intermediate Frequency
	IND	:	Indicator
	INV	:	Inverter
K	KIL	:	Killer
L	L	:	Left
	LED	:	Light Emitting Diode
	LIMIT AMP	:	Limiter Amplifier
	LM, LDM	:	Loading Motor
	LP	:	Long Play
	L.P.F	:	Low Pass Filter
	LUMI.	:	Luminance
M	M	:	Motor
	MAX	:	Maximum
	MINI	:	Minimum
	MIX	:	Mixer, mixing
	MM	:	Monostable Multivibrator
	MOD	:	Modulator, Modulation
	MPX	:	Multiplexer, Multiplex
	MS SW	:	Mecha State Switch
N	NC	:	Non Connection
	NR	:	Noise Reduction
O	OSC	:	Oscillator
	OPE	:	Operation
P	PB	:	Playback
	PB CTL	:	Playback Control
	PB-C	:	Playback-Chrominance
	PB-Y	:	Playback-Luminance
	PCB	:	Printed Circuit Board
	P. CON	:	Power Control
	PD	:	Phase Detector
	PG	:	Pulse Generator
	P-P	:	Peak-to Peak
R	R	:	Right
	REC	:	Recording
	REC-C	:	Recording-Chrominance
	REC-Y	:	Recording-Luminance
	REEL BRK	:	Reel Brake
	REEL S	:	Reel Sensor
	REF	:	Reference
	REG	:	Regulated, Regulator
	REW	:	Rewind
	REV, RVS	:	Reverse
	RF	:	Radio Frequency
	RMC	:	Remote Control
	RY	:	Relay
S	S. CLK	:	Serial Clock
	S. COM	:	Sensor Common
	S. DATA	:	Serial Data
	SEG	:	Segment
	SEL	:	Select, Selector
	SENS	:	Sensor
	SER	:	Search Mode
	SI	:	Serial Input
	SIF	:	Sound Intermediate Frequency
	SO	:	Serial Output
	SOL	:	Solenoid
	SP	:	Standard Play
	STB	:	Serial Strobe
	SW	:	Switch

KEY TO ABBREVIATIONS

S	**SYNC**	:	Synchronization
	SYNC SEP	:	Sync Separator, Separation
T	**TR**	:	Transistor
	TRAC	:	Tracking
	TRICK PB	:	Trick Playback
	TP	:	Test Point
U	**UNREG**	:	Unregulated
V	**V**	:	Volt
	VCO	:	Voltage Controlled Oscillator
	VIF	:	Video Intermediate Frequency
	VP	:	Vertical Pulse, Voltage Display
	V.PB	:	Video Playback
	VR	:	Variable Resistor
	V.REC	:	Video Recording
	VSF	:	Visual Search Fast Forward
	VSR	:	Visual Search Rewind
	VSS	:	Voltage Super Source
	V-SYNC	:	Vertical-Synchronization
	VT	:	Voltage Tuning
X	**X'TAL**	:	Crystal
Y	**Y/C**	:	Luminance/Chrominance

SERVICE MODE LIST

This unit provided with the following SERVICE MODES so you can repair, examine and adjust easily.

To enter SERVICE MODE, unplug AC cord till lost actual clock time. Then press and hold Vol (-) button of main unit and remocon key for more than 2 seconds.

The both pressing of set key and remote control key will not be possible if clock has been set. To reset clock, either unplug AC cord and allow at least 30 minutes before Power On or alternatively, discharge backup capacitor.

Set Key	Remocon Key	Operations
VOL. (-) MIN	1	Initialization of the factory. NOTE: Do not use this for the normal servicing. If you set a factory initialization, the memories are reset such as the clock setting, the channel setting, the POWER ON total hours, and PLAY/REC total hours.
VOL. (-) MIN	2	Horizontal position adjustment of OSD. NOTE: Also can be adjusted by using the Adjustment MENU. Refer to the "ELECTRICAL ADJUSTMENT" (OSD HORIZONTAL).
VOL. (-) MIN	3	Adjust the PG SHIFTER automatically. Refer to the "ELECTRICAL ADJUSTMENT" (PG SHIFTER).
VOL. (-) MIN	4	Adjust the PG SHIFTER manually. Refer to the "ELECTRICAL ADJUSTMENT" (PG SHIFTER).
VOL. (-) MIN	5	Adjusting of the Tracking to the center position. NOTE: Also can be adjusted by pressing the ATR button for more tan 2 seconds during PLAY.
VOL. (-) MIN	6	POWER ON total hours and PLAY/REC total hours are displayed on the screen. Refer to the "PREVENTIVE CHECKS AND SERVICE INTERVALS" (CONFIRMATION OF HOURS USED). Can be checked of the INITIAL DATA of MEMORY IC. Refer to the "WHEN REPLACING EEPROM (MEMORY) IC".
VOL. (-) MIN	7	Releasing of PROTECTION PASSWORD.
VOL. (-) MIN	8	Writing of EEPROM initial data. NOTE: Do not use this for the normal servicing.
VOL. (-) MIN	9	Display of the Adjustment MENU on the screen. Refer to the "ELECTRICAL ADJUSTMENT" (On-Screen Display Adjustment).

Method	Operations
Press the ATR button on the remote control for more than 2 seconds during PLAY.	Adjusting of the Tracking to the center position. Refer to the "MECHANICAL ADJUSTMENT" (GUIDE ROLLER) and "ELECTRICAL ADJUSTMENT" (PG SHIFTER).
Make the short circuit between the test point of SERVICE and the GND.	The BOT, EOT and the Reel Sensor do not work and the deck can be operated without a cassette tape. Refer to the "PREPARATION FOR SERVICING"

PREVENTIVE CHECKS AND SERVICE INTERVALS

The following standard table depends on environmental conditions and usage.
Parts replacing time does not mean the life span for individual parts.
Also, long term storage or misuse may cause transformation and aging of rubber parts.
The following list means standard hours, so the checking hours depends on the conditions.

Time / Parts Name	500 hours	1,000 hours	1,500 hours	2,000 hours	2,500 hours	Notes
Audio Control Head	■	■	■	●	●	Clean those parts in contact with the tape.
Full Erase Head (Recorder only)	■	■	■	●	●	
Capstan Belt		●	●	●	●	Clean the rubber, and parts which the rubber touches.
Pinch Roller	■	●	●	●	●	
Capstan DD Unit		●	●	●	●	
Loading Motor					●	
Tension Band		●	●	●	●	
T Brake Band		●	●	●	●	
Clutch Ass'y		●	●	●	●	
Idler Arm Ass'y		●	●	●	●	
Capstan Shaft	■	■	■	■	■	
Tape Running Guide Post	■	■	■	■	■	Replace when rolling becomes abnormal.
Cylinder Unit	■	●	●	●	●	Clean the Head

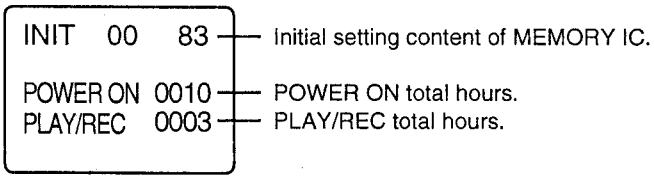
■ : Clean
● : Check it and if necessary, replace it.

CONFIRMATION OF HOURS USED

POWER ON total hours and PLAY/REC total hours can be checked on the screen.
Total hours are displayed in 16 system of notation.

NOTE: If you set a factory initialization, the total hours is reset to "0".
The confirmation of using hours will not be possible if clock has been set. To reset clock, either unplug AC cord and allow at least 30 minutes before Power On.

1. Set the VOLUME to minimum.
2. Press both VOL. DOWN button on the set and the Channel button **(6)** on the remote control for more than 2 seconds.
3. After the confirmation of using hours, turn off the power.



(16 x 16 x 16 x thousands digit value) + (16 x 16 x hundreds digit value) + (16 x tens digit value) + (ones digit value)

PREVENTIVE CHECKS AND SERVICE INTERVALS

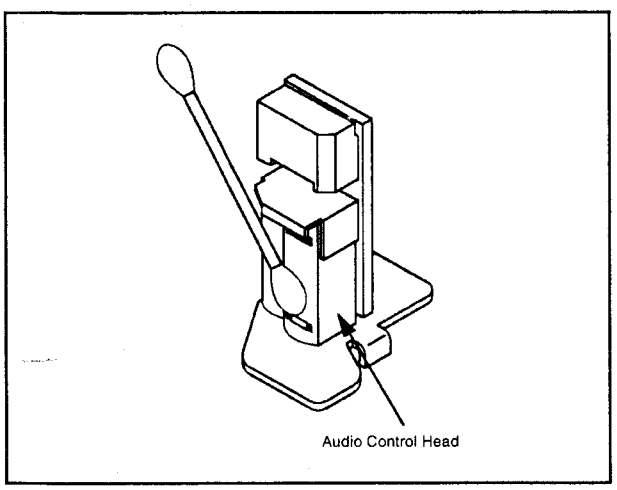
CLEANING

NOTE

After cleaning the heads with isopropyl alcohol, do not run a tape until the heads dry completely. If the heads are not completely dry and alcohol gets on the tape, damage may occur.

1. AUDIO CONTROL HEAD

Clean the Audio Control Head with the cotton stick soaked by alcohol. Clean the full erase head in the same manner. **(Refer to the figure below.)**



2. TAPE RUNNING SYSTEM

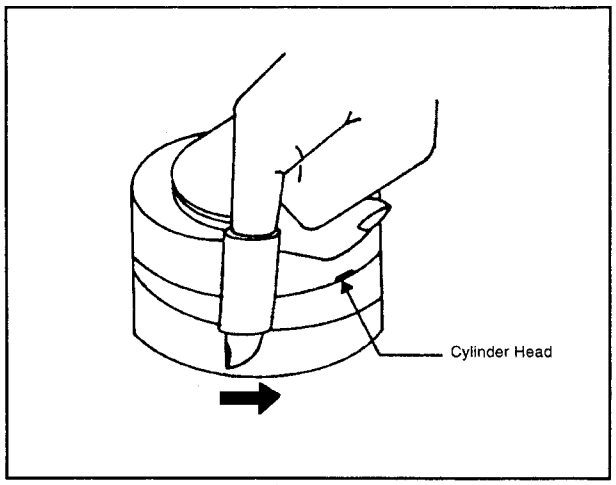
When cleaning the tape transport system, use the gauze moistened with isopropyl alcohol.

3. CYLINDER

Wrap a piece of chamois around your finger. Dip it in isopropyl alcohol. Hold it to the cylinder head softly. Turn the cylinder head counterclockwise to clean it (in the direction of the arrow). **(Refer to the figure below.)**

NOTE

Do not exert force against the cylinder head. Do not move the chamois upward or downward on the head.
Use the chamois one by one.



WHEN REPLACING EEPROM (MEMORY) IC

If a service repair is undertaken where it has been required to change the MEMORY IC, the following steps should be taken to ensure correct data settings while making reference to TABLE 1.

NOTE: Initial Data setting will not be possible if clock has been set. To reset clock, either unplug AC cord and allow at least 30 minutes before Power On.

INI	+0	+1	+2	+3	+4	+5	+6	+7	+8	+9	+A	+B	+C	+D	+E	+F
00	00	16	07	81	6E	02	00	2D	C0	21	21	16	0C	07	40	00
10	00	05	63	65	66	09	27	00	05	00	18	00	00	00	00	00
20	01	0B	01	00	04	6A	52	F5	09	A0	87	00	00	5F	08	F0
30	25	F0	00	00	00	00	00	5F	01	F0	01	F0	0E	00	01	6C
40	38	21	15	28	A0	C4	20	08	BF	10	00	00	00	00	00	00

Table 1

1. Enter DATA SET mode by setting VOLUME to minimum.
2. While holding down VOLUME button on front cabinet, press key 6 on remote control simultaneously. ADDRESS and DATA should appear as FIG 1.

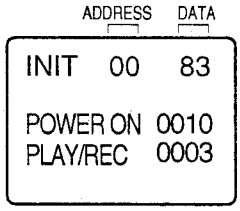
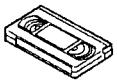
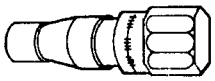
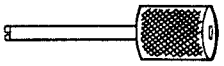
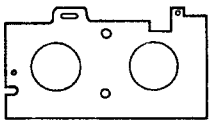
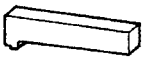
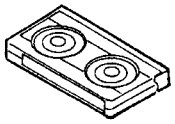
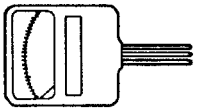


Fig. 1

3. ADDRESS is now selected and should "blink". Using the PLAY or STOP button on the remote, step through the ADDRESS until required ADDRESS to be changed is reached.
4. Press ENTER to select DATA. When DATA is selected, it will "blink".
5. Again, step through the DATA using PLAY or STOP button until required DATA value has been selected.
6. Pressing ENTER will take you back to ADDRESS for further selection if necessary.
7. Repeat steps 3 to 6 until all data has been checked.
8. When satisfied correct DATA has been entered, turn POWER off (return to STANDBY MODE) to finish DATA input.

The unit will now have the correct DATA for the new MEMORY IC.

SERVICING FIXTURES AND TOOLS

(For 2 head 1 speed model, 4 head model) VHS Alignment Tape JG001E (VP_1S-LI6^3) JG001F (VP_1S-CO1^3) JG001R (VP_1S-LI6^{3}H) JG001U (VP_1S-X6^3) 	**(For 2 head 2 speed model)** VHS Alignment Tape JG001C (VP_2S-LI6^3) JG001D (VP_2S-CO1^3) JG001V (VP_2S-X6^3) 	JG002B Adapter JG002E Dial Torque Gauge (10~90gf•cm) JG002F (60~600gf•cm) 	JG005 Post Adjustment Screwdriver Part No. SV-TG0-030-000 (small) 
JG153 X Value Adjustment Screwdriver 	JG022 Master Plane 	JG024A Reel Disk Height Adjustment Jig 	JG100A Torque Tape (VHT-063) 
JG154 Cable 	Tentelometer 		

Ref. No.	Part No.	Parts Name	Remarks
JG001E	APJG001E00	VHS Alignment Tape	Monoscope, 6KHz **(For 2 head 1 speed model, 4 head model)**
JG001F	APJG001F00	VHS Alignment Tape	Color Bar, 1KHz **(For 2 head 1 speed model, 4 head model)**
JG001R	APJG001R00	VHS Alignment Tape	Hi-Fi Audio **(For Hi-Fi model)**
JG001U	APJG001U00	VHS Alignment Tape	X Value Adjustment **(For 2 head 1 speed model, 4 head model)**
JG001C	APJG001C00	VHS Alignment Tape	Monoscope, 6KHz **(For 2 head 2 speed model)**
JG001D	APJG001D00	VHS Alignment Tape	Color Bar, 1KHz **(For 2 head 2 speed model)**
JG001V	APJG001V00	VHS Alignment Tape	X Value Adjustment **(For 2 head 2 speed model)**
JG002B	APJG002B00	Adapter	VSR Torque, Brake Torque (S Reel/T Reel Ass'y)
JG002E	APJG002E00	Dial Torque Gauge (10~90gf•cm)	Brake Torque (T Reel Ass'y)
JG002F	APJG002F00	Dial Torque Gauge (60~600gf•cm)	VSR Torque, Brake Torque (S Reel)
JG005	APJG005000	Post Adjustment Screwdriver	Guide Roller Adjustment
JG153	APJG153000	X Value Adjustment Screwdriver	X Value Adjustment
JG022	APJG022000	Master Plane	Reel Disk Height Adjustment
JG024A	APJG024A00	Reel Disk Height Adjustment Jig	Reel Disk Height Adjustment
JG100A	APJG100A00	Torque Tape (VHT-063)	Playback Torque, Back Tension Torque During Playback
JG154	APJG154000	Cable	Used to connect the test point of SERVICE and GROUND

MECHANICAL ADJUSTMENTS

1. CONFIRMATION AND ADJUSTMENT

Read the following NOTES before starting work.

- Place an object which weighs between 450g~500g on the Cassette Tape to keep it steady when you want to make the tape run without the Cassette Holder. (Do not place an object which weighs over 500g.)

1-1: CONFIRMATION AND ADJUSTMENT OF REEL DISK HEIGHT

1. Turn on the power and set to the STOP mode.
2. Set the master plane **(JG022)** and reel disk height adjustment jig **(JG024A)** on the mechanism framework, taking care not to scratch the drum, as shown in **Fig. 1-1-A.**
3. While turning the reel and confirm the following points. Check if the surface "A" of reel disk is lower than the surface "B" of reel disk height adjustment jig **(JG024A)** and is higher than the surface "C". If it is not passed, place the height adjustment washers and adjust to 10(+2, -0)mm.
4. Adjust the other reel in the same way.

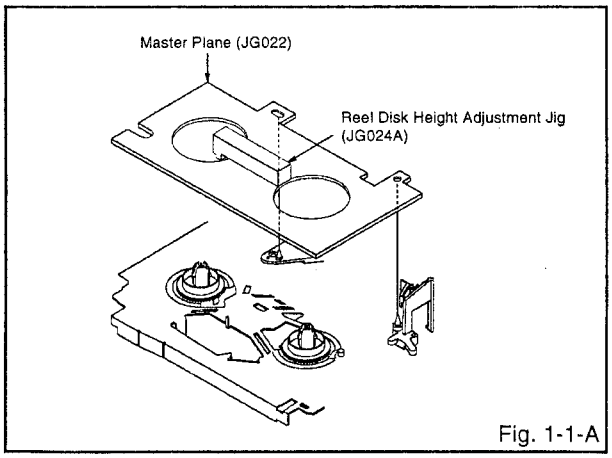


Fig. 1-1-A

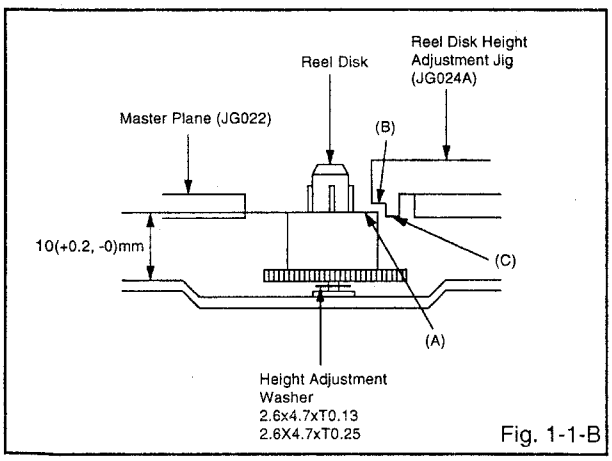


Fig. 1-1-B

1-2: CONFIRMATION AND ADJUSTMENT OF TENSION POST POSITION

1. Set to the PLAY mode.
2. Adjust the adjusting section for the Tension Arm position so that the Tension Arm top is within the standard line of Main Chassis.
3. While turning the S Reel clockwise, confirm that the edge of the Tension Arm is located in the position described above.

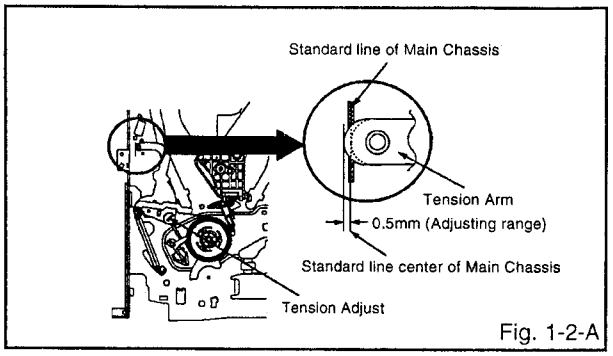


Fig. 1-2-A

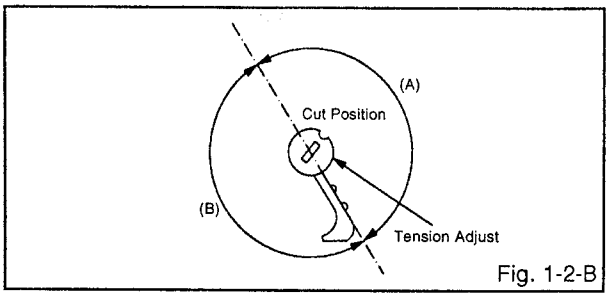


Fig. 1-2-B

1-3: CONFIRMATION OF PLAYBACK TORQUE AND BACK TENSION TORQUE DURING PLAYBACK

1. Load a video tape (E-180) recorded in standard speed mode. Set the unit to the PLAY mode.
2. Install the tentelometer as shown in **Fig. 1-3.** Confirm that the meter indicates 20 ± 2gf in the beginning of playback.

• USING A CASSETTE TYPE TORQUE TAPE **(JG100A)**

1. After confirmation and adjustment of Tension Post position **(Refer to item 1-2)**, load the cassette type torque tape **(JG100A)** and set to the PLAY mode.
2. Confirm that the right meter of the torque tape indicates 60~110gf•cm during playback in SP mode.
3. Confirm that the left meter of the torque tape indicates 25~40gf•cm during playback in SP mode.

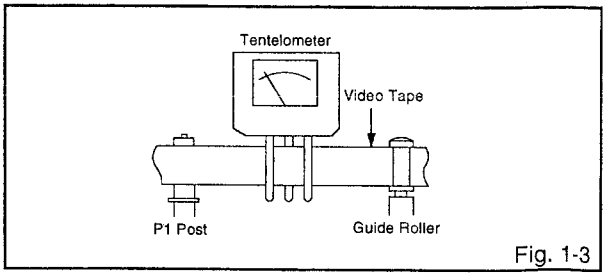


Fig. 1-3

MECHANICAL ADJUSTMENTS

1-4: CONFIRMATION OF VSR TORQUE

1. Install the Torque Gauge **(JG002F)** and Adapter **(JG002B)** on the S Reel. Set to the Picture Search (Rewind) mode. **(Refer to Fig.1-4)**
2. Then, confirm that it indicates 120~180gf•cm.

NOTE

Install the Torque Gauge on the reel disk firmly. Press the REW button to turn the reel disk.

1-5: CONFIRMATION OF REEL BRAKE TORQUE

(S Reel Brake) **(Refer to Fig. 1-4-B)**

1. Once set to the Fast Forward mode then set to the Stop mode. While, unplug the AC cord when the Pinch Roller Block is on the position of **Fig. 1-4-A.**
2. Move the Idler Ass'y from the S Reel.
3. Install the Torque Gauge **(JG002F)** and Adapter **(JG002B)** on the S Reel. Turn the Torque Gauge **(JG002F)** clockwise.
4. Then, confirm that it indicates 60~100gf•cm.

(T Reel Brake) **(Refer to Fig. 1-4-B)**

1. Once set to the Fast Forward mode then set to the Stop mode. While, unplug the AC cord when the Pinch Roller Block is on the position of **Fig. 1-4-A.**
2. Move the Idler Ass'y from the T Reel.
3. Install the Torque Gauge **(JG002E)** and Adapter **(JG002B)** on the T reel. Turn the Torque Gauge **(JG002E)** counterclockwise.
4. Then, confirm that it indicates 45~70gf•cm.

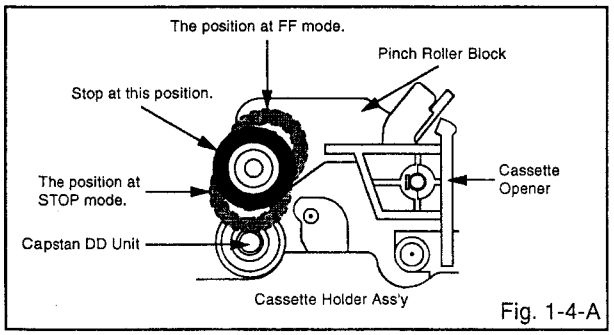


Fig. 1-4-A

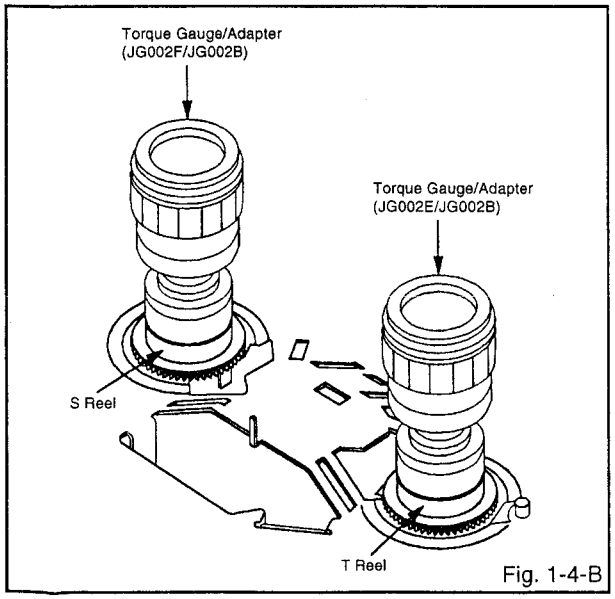


Fig. 1-4-B

NOTE

If the torque is out of the range, replace the following parts.

Check item	Replacement Part
1-4	Idler Ass'y/Clutch Ass'y
1-5	S Reel side: S Reel/Tension Band Ass'y/ Tension Arm Ass'y T Reel side: T Reel/T Brake Spring/T Brake Ass'y

2. CONFIRMATION AND ADJUSTMENT OF TAPE RUNNING MECHANISM

Tape Running Mechanism is adjusted precisely at the factory. Adjustment is not necessary as usual. When you replace the parts of the tape running mechanism because of long term usage or failure, the confirmation and adjustment are necessary.

2-1: GUIDE ROLLER

1. Playback the VHS Alignment Tape **(JG001C or JG001E). (Refer to SERVICING FIXTURE AND TOOLS)**
2. Connect CH-1 of the oscilloscope to **TP4002 (Envelope)** and CH-2 to **TP4001 (SW Pulse).**
3. Press and hold the Tracking-Auto button on the remote control more than 2 seconds to set tracking to center.
4. Trigger with SW Pulse and observe the envelope. **(Refer to Fig. 2-1-A)**
5. When observing the envelope, adjust the Adjusting Driver **(JG005)** slightly until the envelope will be flat. Even if you press the Tracking Button, adjust so that flatness is not moved so much.
6. Adjust so that the A : B ratio is better than 3 : 2 as shown in **Fig. 2-1-B,** even if you press the Tracking Button to move the envelope (The envelope waveform will begin to decrease when you press the Tracking Button).
7. Adjust the PG shifter during playback. **(Refer to the ELECTRICAL ADJUSTMENTS)**

NOTE

After adjustment, confirm and adjust A/C head. **(Refer to item 2-2)**

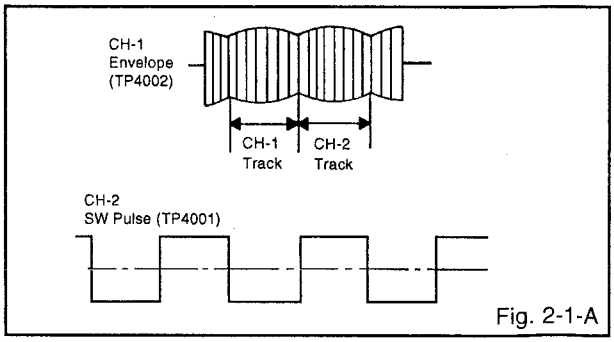


Fig. 2-1-A

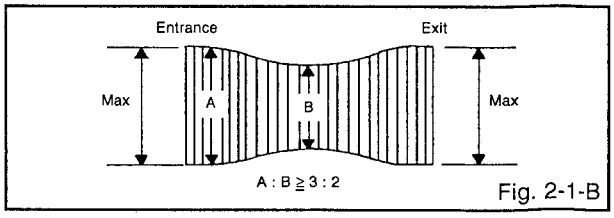


Fig. 2-1-B

MECHANICAL ADJUSTMENTS

2-2: CONFIRMATION AND ADJUSTMENT OF AUDIO/ CONTROL HEAD

When the Tape Running Mechanism does not work well, adjust the following items.

1. Playback the VHS Alignment Tape **(JG001C or JG001E). (Refer to SERVICING FIXTURE AND TOOLS)**
2. Confirm that the reflected picture of stamp mark is appeared on the tape prior to P4 Post as shown in **Fig. 2-2-A.**
   a) When the reflected picture is distorted, turn the screw ① clockwise until the distortion is disappeared.
   b) When the reflected picture is not distorted, turn the screw ① counterclockwise until little distortion is appeared, then adjust the a).
3. Turn the screw ② to set the audio level to maximum.
4. Confirm that the bottom of the Audio/ Control Head and the bottom of the tape is shown in **Fig. 2-2-C.**
   c) When the height is not correct, turn the screw ③ to adjust the height. Then, adjust the 1~3 again.

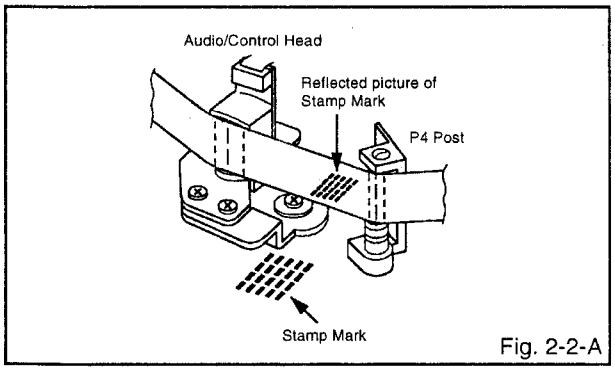


Fig. 2-2-A

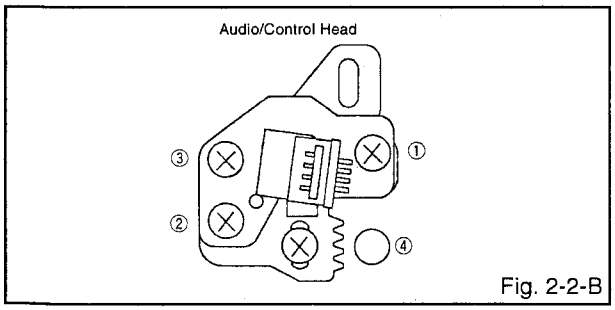


Fig. 2-2-B

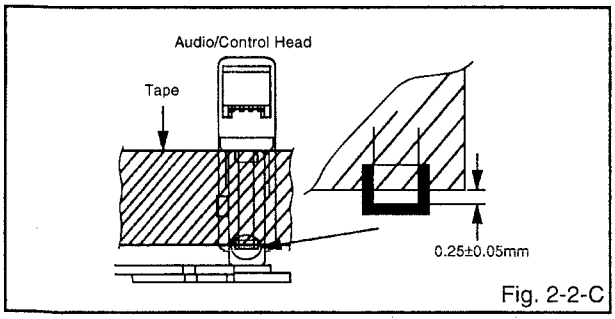


Fig. 2-2-C

2-3: TAPE RUNNING ADJUSTMENT (X VALUE ADJUSTMENT)

1. Confirm and adjust the height of the Reel Disk. **(Refer to item 1-1)**
2. Confirm and adjust the position of the Tension Post. **(Refer to item 1-2)**
3. Adjust the Guide Roller. **(Refer to item 2-1)**
4. Confirm and adjust the Audio/Control Head. **(Refer to item 2-2)**
5. Connect CH-1 of the oscilloscope to **TP4002,** CH-2 to **TP4001** and CH-3 to **HOT side of Audio Out Jack.**
6. Playback the VHS Alignment Tape **(JG001U or JG001V). (Refer to SERVICING FIXTURE AND TOOLS)**
7. Press and hold the Tracking-Auto button on the remote control more than 2 seconds to set tracking to center.
8. Set the X Value adjustment driver **(JG153)** to the ④ **of Fig. 2-2-B.** Adjust X value so that the envelope waveform output becomes maximum. Check if the relation between Audio and Envelope waveform becomes (1) or (2) of **Fig. 2-3.**

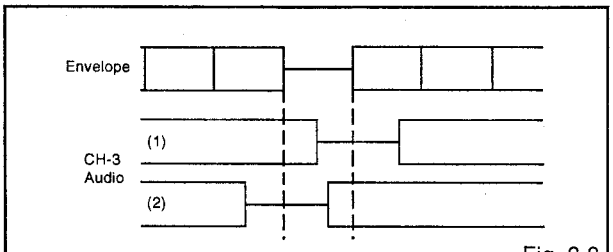


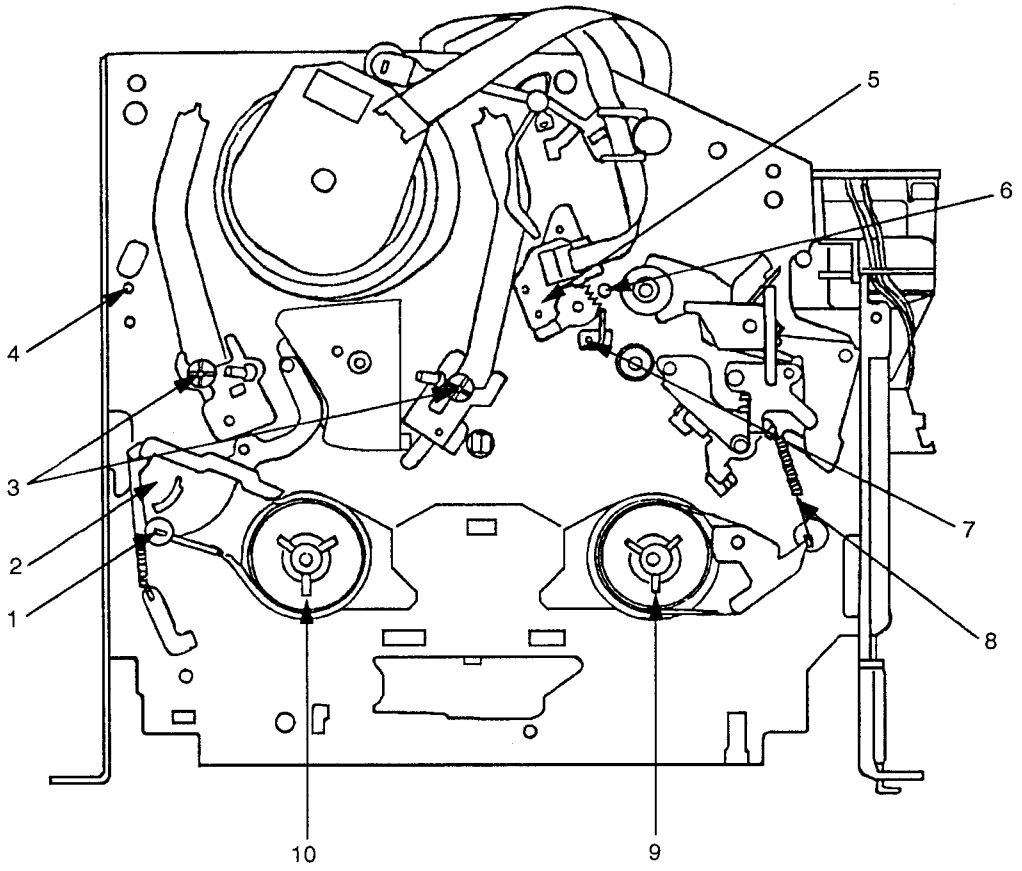
Fig. 2-3

2-4: CONFIRM HI-FI AUDIO (Hi-Fi model only)

1. Connect CH-1 of the oscilloscope to **TP4002** and CH-2 to the **Hi-Fi Audio Out Jack.**
2. Playback the VHS Alignment Tape **(JG001R). (Refer to SERVICING FIXTURE AND TOOLS)**
3. Press and hold the Tracking-Auto button on the remote control more than 2 seconds to set tracking to center.
4. Press the Tracking Up button and count number of steps which the audio output is changed from Hi-Fi (10KHz) to MONO (6KHz).
5. Press and hold the Tracking-Auto button on the remote control more than 2 seconds to set tracking to center.
6. Press the Tracking Down button and count number of steps which the audio output is changed from Hi-Fi (10KHz) to MONO (6KHz).
7. If the difference are more than 3 steps, set the X Value adjustment driver **(JG153)** to ④ of **Fig. 2-2-B.** Change the X Value and adjust it so that the value becomes within 2 steps.

MECHANICAL ADJUSTMENTS

3. MECHANISM ADJUSTMENT PARTS LOCATION GUIDE



1. Tension Adjust
2. Tension Arm
3. Guide Roller
4. P1 Post
5. Audio/Control Head
6. X value adjustment driver hole
7. P4 Post
8. T Brake Spring
9. T Reel
10. S Reel

ELECTRICAL ADJUSTMENTS

1. ADJUSTMENT PROCEDURE

Read and perform these adjustments when repairing the circuits or replacing electrical parts or PCB assemblies.

CAUTION

When replacing IC's or transistors, use only specified silicon grease. **(YG6260M)**
(To prevent the damage to IC's and transistors.)

On-Screen Display Adjustment

1. Unplug the AC plug for more than 30 minutes to set the clock to the non-setting state. Then, set the volume level to minimum.
2. Press the VOL. DOWN button on the set and the channel button **(9)** on the remote control for more than 2 seconds to display adjustment mode on the screen as shown in **Fig. 1-1**.

NOTE

Use the channel buttons **(1-8)** on the remote control to select the options shown in **Fig. 1-1.**
Press the channel button **(0)** or MENU button on the remote control to end the adjustments.

1. H/V
2. AKB
3. COLOR TEMP
4. PICTURE
5. OTHERS
6. TEST PATTERN
7.
8. 0. END

Fig. 1-1

2. BASIC ADJUSTMENTS (VCR SECTION)

2-1: PG SHIFTER

1. Connect CH-1 on the oscilloscope to **TP4001** and CH-2 to **TP4002.**
2. Playback the alignment tape. **(JG001F)**
3. Press and hold the Tracking-Auto button on the remote control more than 2 seconds to set tracking to center.
4. Press the VOL. DOWN button on the set and the channel button **(3)** on the remote control simultaneously until the indicator REC disappears. If the indicator REC disappears, adjustment is completed.

(If the above adjustments doesn't work well:)

5. Press the VOL. DOWN button on the set and the channel button **(3)** on the remote control simultaneously until the indicator REC disappears.
6. When the REC indicator is blinking, press both VOL. DOWN button on the set and the channel button **(4)** on the remote control simultaneously and adjust the Tracking +/- button until the arising to the down of Head Switching Pulse becomes 6.5 ± 0.5H.
(Refer to Fig. 2-1-A, B)
7. Press the Tracking Auto button.

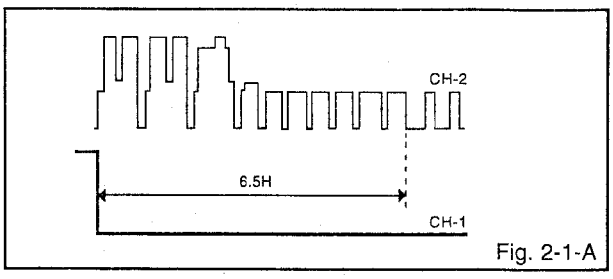


Fig. 2-1-A

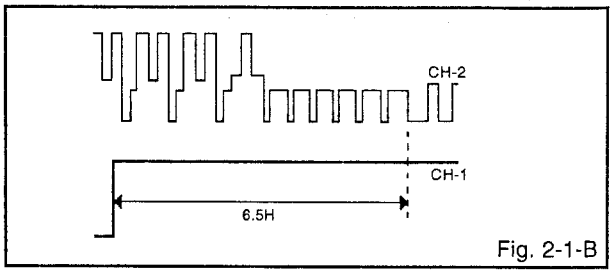


Fig. 2-1-B

2-2: VCO (AFT)

1. Connect the oscillator (38.9MHz) to **pin 11 of TU601** through 100 ohm resistor.
2. Connect the digital voltmeter to **pin 47 of IC601.**
3. Adjust the **L608** until the digital voltmeter is 3.8 ± 0.05V.

2-3: RF AGC

1. Receive the UHF (80dB).
2. Connect the digital voltmeter between the **pin 5 of CP603** and the **pin 1 (GND) of CP603.**
3. Activate the adjustment mode display of **Fig. 1-1** and press the channel button **(05)** on the remote control to select "OTHERS". The **Fig. 2-2** appears on the display.
4. Press the channel button **(01)** on the remote control to select "RF AGC DELAY".
5. Press the F.FWD and REW button on the remote control until the digital voltmeter is 1.55 ± 0.05V.

1. RF AGC DELAY
2. VIDEO LEVEL
3. FM LEVEL
4. OSD H
5. CUT OFF
6. (CHROMA VOL)
7.
8. 0. RETURN

Fig. 2-2

ELECTRICAL ADJUSTMENTS

(TV SECTION)

2-4: CONSTANT VOLTAGE (AC)

1. Connect the digital voltmeter to **TP401**.
2. Set condition is AV MODE without signal.
3. Adjust the **VR502** until the DC voltage is 101 ± 0.5V.

2-5: CONSTANT VOLTAGE (DC)

1. Connect the digital voltmeter to **TP401**.
2. Set condition is AV MODE without signal.
3. Adjust the **VR501** until the DC voltage is 100 ± 0.5V.

2-6: CUT OFF

1. Place the set with Aging Test for more than 15 minutes.
2. Set condition is AV MODE without signal.
3. Using the remote control, set the brightness and contrast to normal position.
4. Activate the adjustment mode display of **Fig. 1-1** and press the channel button **(05)** on the remote control to select "OTHERS". The **Fig. 2-2** appears on the display.
5. Press the channel button **(05)** on the remote control to select "CUT OFF".
6. Adjust the **Screen Volume** until a dim raster is obtained.

2-7: FOCUS

1. Receive the monoscope pattern.
2. Turn the Focus Volume fully counterclockwise once.
3. Adjust the **Focus Volume** until picture is distinct.

2-8: WHITE BALANCE

NOTE: Adjust after performing CUT OFF adjustment.

1. Place the set with Aging Test for more than 15 minutes.
2. Receive the white 100% signal from the Pattern Generator.
3. Using the remote control, set the brightness and contrast to normal position.
4. Activate the adjustment mode display of **Fig. 1-1** and press the channel button **(02)** on the remote control to select "AKB". The **Fig. 2-3** appears on the display.
5. Press the channel button **(02)** on the remote control to select the "R. BIAS".
6. Using the F.FWD and REW button on the remote control, adjust the R. BIAS.
7. Press the CH. UP/DOWN button on the remote control to select the "G. BIAS", "B. BIAS", "R. DRIVE", "G. DRIVE" or "B. DRIVE".
8. Using the F.FWD and REW button on the remote control, adjust the G. BIAS, B. BIAS, R. DRIVE, G. DRIVE or B. DRIVE.
9. Perform the above adjustments 7 and 8 until the white color is looked like a white.

1. AKB AUTO
2. R. BIAS
3. G. BIAS
4. B. BIAS
5. R. DRIVE
6. G. DRIVE
7. B. DRIVE
8. AGC AUTO 0. RETURN

Fig. 2-3

2-9: HORIZONTAL PHASE

1. Receive the center cross signal from the Pattern Generator.
2. Using the remote control, set the brightness and contrast to normal position.
3. Activate the adjustment mode display of **Fig. 1-1** and press the channel button **(01)** on the remote control to select "H/V". The **Fig. 2-4** appears on the display.
4. Press the channel button **(01)** on the remote control to select "H. PHASE".
5. Press the F.FWD and REW button on the remote control until the vertical line becomes fit to the notch of the shadow mask.

1. H. PHASE
2. H. BLK
3. V. SIZE 50/60
4. V. POSI 50/60
5. V. LIN 50/60
6. V. SC 50/60
7. V. COMP
8. (H FREQ) 0. RETURN

Fig. 2-4

2-10: VERTICAL SIZE

NOTE: Adjust after performing adjustments in section 2-8.

1. Receive the cross hatch signal from the Pattern Generator.
2. Using the remote control, set the brightness and contrast to normal position.
3. Activate the adjustment mode display of **Fig. 1-1** and press the channel button **(01)** on the remote control to select "H/V". The **Fig. 2-4** appears on the display.
4. Press the channel button **(03)** on the remote control to select "V. SIZE 50/60".
5. Press the F.FWD and REW button on the remote control until the rectangle on the center of the screen becomes square.
6. Receive a broadcast and check if the picture is normal.
7. Receive the cross hatch signal of NTSC. (Audio Video Input)
8. Press the AV button on the remote control to set to the AV mode. Then perform the above adjustments 2~5.

2-11: H. BLK

1. Activate the adjustment mode display of **Fig. 1-1** and press the channel button **(01)** on the remote control to select "H/V". The **Fig. 2-4** appears on the display.
2. Press the channel button **(02)** on the remote control to select "H. BLK".
3. Switch the R/L by using the ENTER button on the remote control and check if the H. BLK step No. becomes "R2, L4".

ELECTRICAL ADJUSTMENTS

2-12: VERTICAL LINEALITY

NOTE: Adjust after performing adjustments in section 2-10.

1. Receive the cross hatch signal from the Pattern Generator.
2. Using the remote control, set the brightness and contrast to normal position.
3. Activate the adjustment mode display of **Fig. 1-1** and press the channel button **(01)** on the remote control to select "H/V". The **Fig. 2-4** appears on the display.
4. Press the channel button **(05)** on the remote control to select "V. LIN 50/60".
5. Press the F.FWD and REW button on the remote control until the SHIFT quantity of the OVER SCAN on upside and downside becomes minimum.
6. Receive the cross hatch signal of NTSC. (Audio Video Input)
7. Press the AV button on the remote control to set to the AV mode. Then perform the above adjustments 2~5.

2-13: VERTICAL POSITION

NOTE: Adjust after performing adjustments in section 2-11.

1. Receive the center cross signal from the Pattern Generator.
2. Using the remote control, set the brightness and contrast to normal position.
3. Activate the adjustment mode display of **Fig. 1-1** and press the channel button **(01)** on the remote control to select "H/V". The **Fig. 2-4** appears on the display.
4. Press the channel button **(04)** on the remote control to select "V. POSI 50/60".
5. Check if the step No. V. POSI is "28".
6. Adjust the **VR402** until the horizontal line becomes fit to the notch of the shadow mask.
7. Receive the center cross signal of NTSC. (Audio Video Input)
8. Using the remote control, set the brightness and contrast to normal position.
9. Activate the adjustment mode display of **Fig. 1-1** and press the channel button **(01)** on the remote control to select "H/V". The **Fig. 2-4** appears on the display.
10. Press the channel button **(04)** on the remote control to select "V. POSI 50/60".
11. Press the F.FWD and REW button on the remote control until the horizontal line becomes fit to the notch of the shadow mask.

2-14: OSD HORIZONTAL

1. Using the remote control, set the brightness and contrast to normal position.
2. Activate the adjustment mode display of **Fig. 1-1** and press the channel button **(05)** on the remote control to select "OTHERS". The **Fig. 2-2** appears on the display.
3. Press the channel button **(04)** on the remote control to select "OSD H".
4. Press the F.FWD and REW button on the remote control until the difference of A and B becomes minimum. **(Refer to Fig. 2-5)**

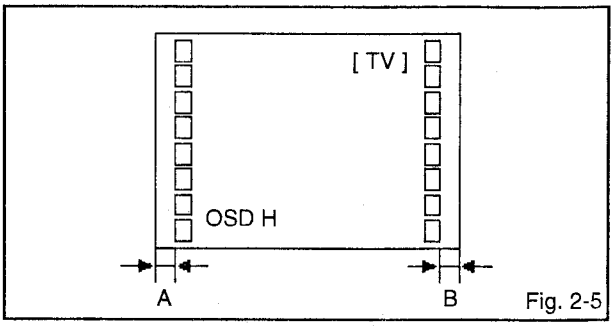


Fig. 2-5

2-15: SUB BRIGHTNESS

1. Receive the monoscope pattern. (RF Input)
2. Using the remote control, set the brightness to min position and contrast to normal position.
3. Activate the adjustment mode display of **Fig. 1-1** and press the channel button **(04)** on the remote control to select "PICTURE". The **Fig. 2-6** appears on the display.
4. Press the channel button **(01)** on the remote control to select "BRIGHT".
5. Press the F.FWD and REW button on the remote control until the white 25% is starting to be visible.
6. Receive the monoscope pattern. (Audio Video Input)
7. Press the AV button on the remote control to set to the AV mode. Then perform the above adjustments 2~5.

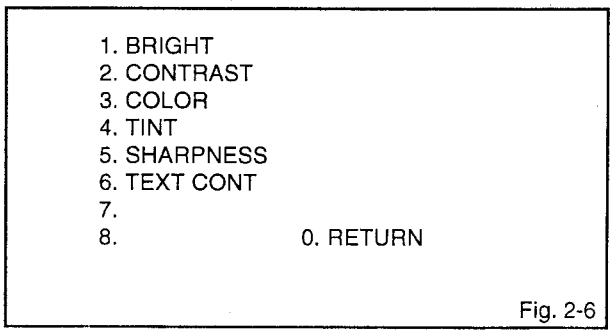


Fig. 2-6

2-16: SUB COLOR

1. Receive the color bar pattern. (RF Input)
2. Using the remote control, set the brightness, contrast and color to normal position.
3. Connect the oscilloscope to **TP801**.
4. Activate the adjustment mode display of **Fig. 1-1** and press the channel button **(04)** on the remote control to select "PICTURE". The **Fig. 2-6** appears on the display.
5. Press the channel button **(03)** on the remote control to select "COLOR".
6. Adjust the VOLTS RANGE VARIABLE knob of the oscilloscope until the range between white 100% and 0% is set to 4 scales on the screen of the oscilloscope.
7. Press the F.FWD and REW button on the remote control until the red color level is adjusted to 95% of the white level. **(Refer to Fig. 2-7)**
8. Receive the color bar pattern. (Audio Video Input)
9. Press the AV button on the remote control to set to the AV mode. Then perform the above adjustments 2~7.

ELECTRICAL ADJUSTMENTS

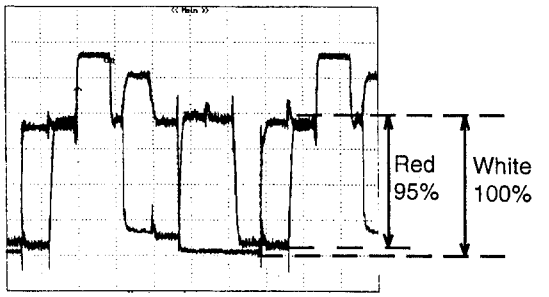


Fig. 2-7

2-17: V. S-CORRECTION (V. SC)

1. Activate the adjustment mode display of **Fig. 1-1** and press the channel button **(01)** on the remote control to select "H/V". The **Fig. 2-4** appears on the display.
2. Press the channel button **(06)** on the remote control to select "V. SC 50/60".
3. Check if the step No. of V. SC is "0".
4. Press the AV button on the remote control to set to the AV mode. Then perform the above adjustments 1~3.

2-18: V. COMP

1. Activate the adjustment mode display of **Fig. 1-1** and press the channel button **(01)** on the remote control to select "H/V". The **Fig. 2-4** appears on the display.
2. Press the channel button **(07)** on the remote control to select "V. COMP".
3. Check if the step No. of V. COMP is "7".

2-19: SUB CONTRAST

1. Receive the monoscope pattern. (RF Input)
2. Activate the adjustment mode display of **Fig. 1-1** and press the channel button **(04)** on the remote control to select "PICTURE". The **Fig. 2-6** appears on the display.
3. Press the channel button **(02)** on the remote control to select "CONTRAST".
4. Check if the step No. of CONTRAST is "95".
5. Press the AV button on the remote control to set to the AV mode. Then perform the above adjustments 2~4.

2-20: SUB SHARPNESS

1. Activate the adjustment mode display of **Fig. 1-1** and press the channel button **(04)** on the remote control to select "PICTURE". The **Fig. 2-6** appears on the display.
2. Press the channel button **(05)** on the remote control to select "SHARPNESS".
3. Check if the step No. of SHARPNESS is "24".
4. Press the AV button on the remote control to set to the AV mode. Then perform the above adjustments 1~3.

2-21: TEXT CONTRAST

1. Using the remote control, set the brightness and contrast to normal position.
2. Activate the adjustment mode display of **Fig. 1-1** and press the channel button **(04)** on the remote control to select "PICTURE". The **Fig. 2-6** appears on the display.
3. Press the channel button **(06)** on the remote control to select "TEXT CONT".
4. Check if the step No. of TEXT CONT is "10".

2-22: E-E LEVEL

1. Receive the color bar pattern. (Audio Video Input)
2. Connect the oscilloscope to **TP4501**.
3. Check if the VIDEO OUTPUT LEVEL is 1 ± 0.2Vp-p. **(Refer to Fig. 2-8)**

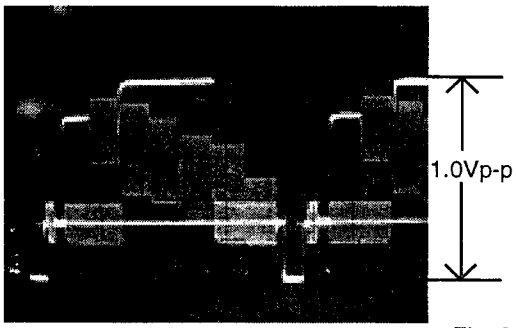


Fig. 2-8

2-23: COLOR LEVEL

1. Receive the color bar pattern. (RF Input)
2. Connect the oscilloscope to **TP4501**.
3. When setting to the Y-LEVEL 100%, check if the MAGENTA is 45 ± 10%. **(Refer to Fig. 2-9)**

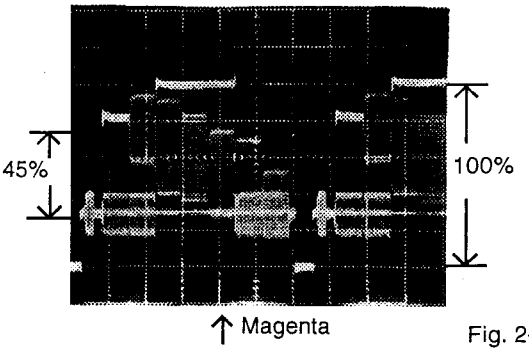


Fig. 2-9

ELECTRICAL ADJUSTMENTS

3. PURITY AND CONVERGENCE ADJUSTMENTS

NOTE

1. Turn the unit on and let it warm up for at least 30 minutes before performing the following adjustments.
2. Place the CRT surface facing east or west to reduce the terrestrial magnetism.
3. Turn ON the unit and demagnetize with a Degauss Coil.

3-1: STATIC CONVERGENCE (ROUGH ADJUSTMENT)

1. Tighten the screw for the magnet. Refer to the adjusted CRT for the position. **(Refer to Fig. 3-1)**
   If the deflection yoke and magnet are in one body, untighten the screw for the body.
2. Receive the green raster pattern from the color bar generator.
3. Slide the deflection yoke until it touches the funnel side of the CRT.
4. Adjust center of screen to green, with red and blue on the sides, using the pair of purity magnets.
5. Switch the color bar generator from the green raster pattern to the crosshatch pattern.
6. Combine red and blue of the 3 color crosshatch pattern on the center of the screen by adjusting the pair of 4 pole magnets.
7. Combine red/blue (magenta) and green by adjusting the pair of 6 pole magnets.
8. Adjust the crosshatch pattern to change to white by repeating steps 6 and 7.

3-2: PURITY

NOTE

Adjust after performing adjustments in section 3-1.

1. Receive the green raster pattern from color bar generator.
2. Adjust the pair of purity magnets to center the color on the screen.
   Adjust the pair of purity magnets so the color at the ends are equally wide.
3. Move the deflection yoke backward (to neck side) slowly, and stop it at the position when the whole screen is green.
4. Confirm red and blue colors.
5. Adjust the slant of the deflection yoke while watching the screen, then tighten the fixing screw.

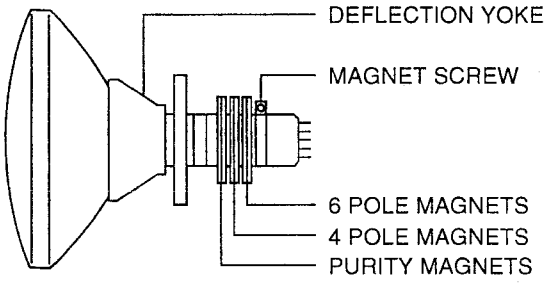


Fig. 3-1

3-3: STATIC CONVERGENCE

NOTE

Adjust after performing adjustments in section 3-2.

1. Receive the crosshatch pattern from the color bar generator.
2. Combine red and blue of the 3 color crosshatch pattern on the center of the screen by adjusting the pair of 4 pole magnets.
3. Combine red/blue (magenta) and green by adjusting the pair of 6 pole magnets.

3-4: DYNAMIC CONVERGENCE

NOTE

Adjust after performing adjustments in section 3-3.

1. Adjust the differences around the screen by moving the deflection yoke upward/downward and right/left. **(Refer to Fig. 3-2-a)**
2. Insert three wedges between the deflection yoke and CRT funnel to fix the deflection yoke. **(Refer to Fig. 3-2-b)**

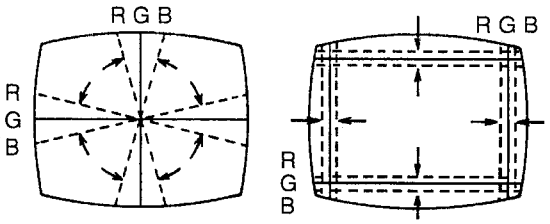


Fig. 3-2-a

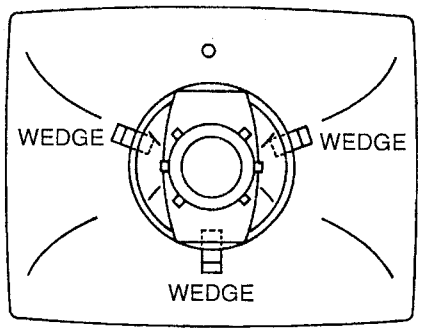
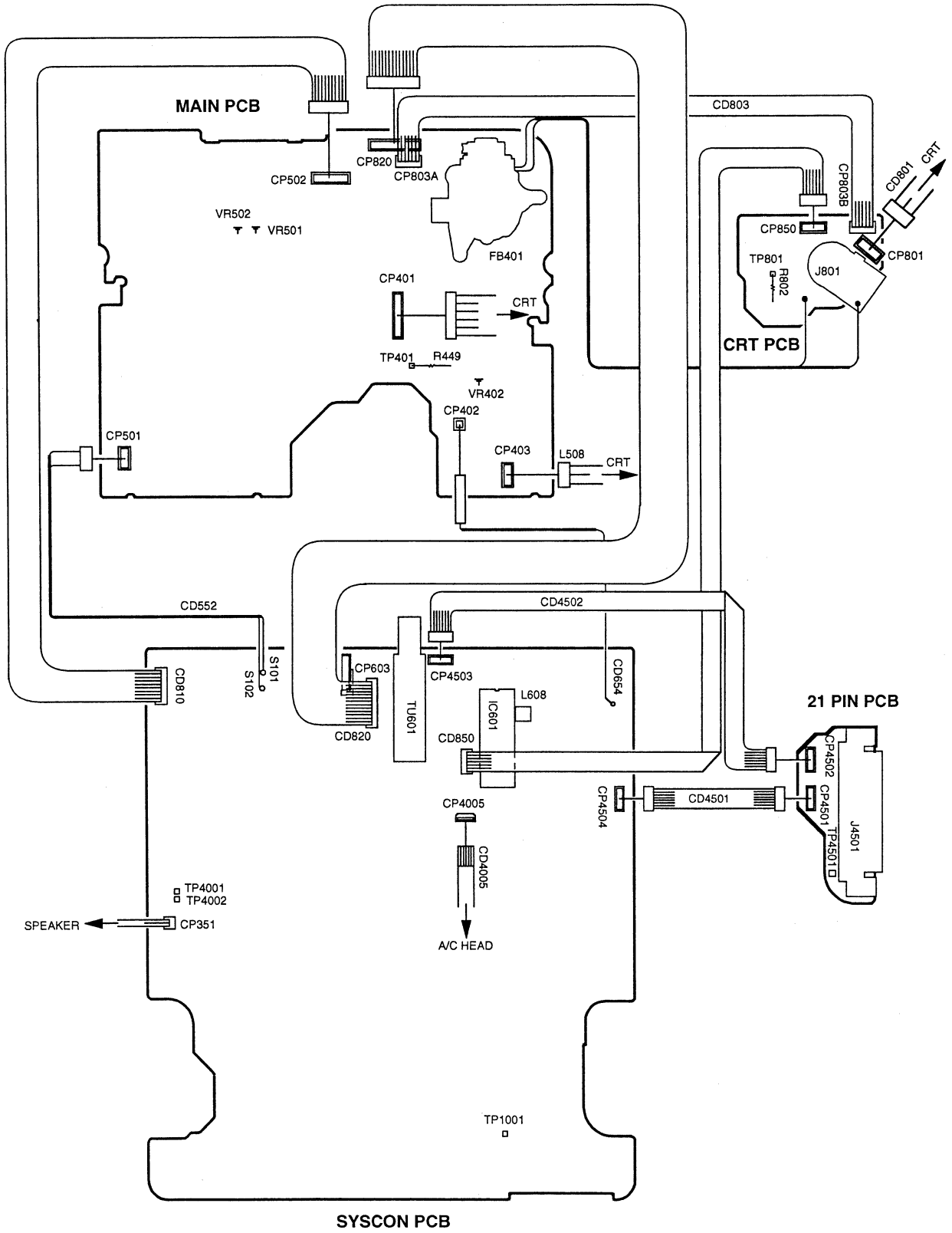


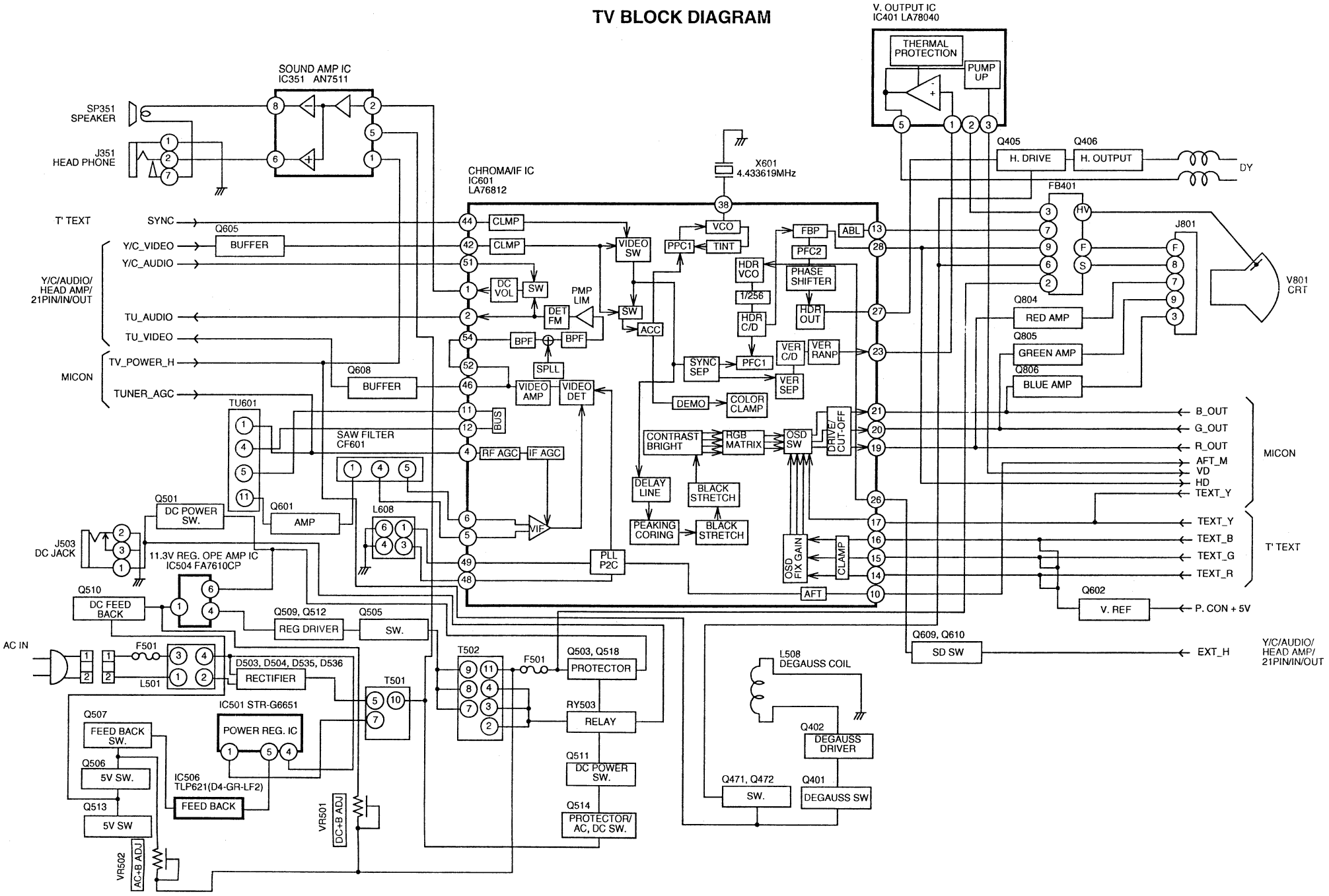
Fig. 3-2-b

ELECTRICAL ADJUSTMENTS

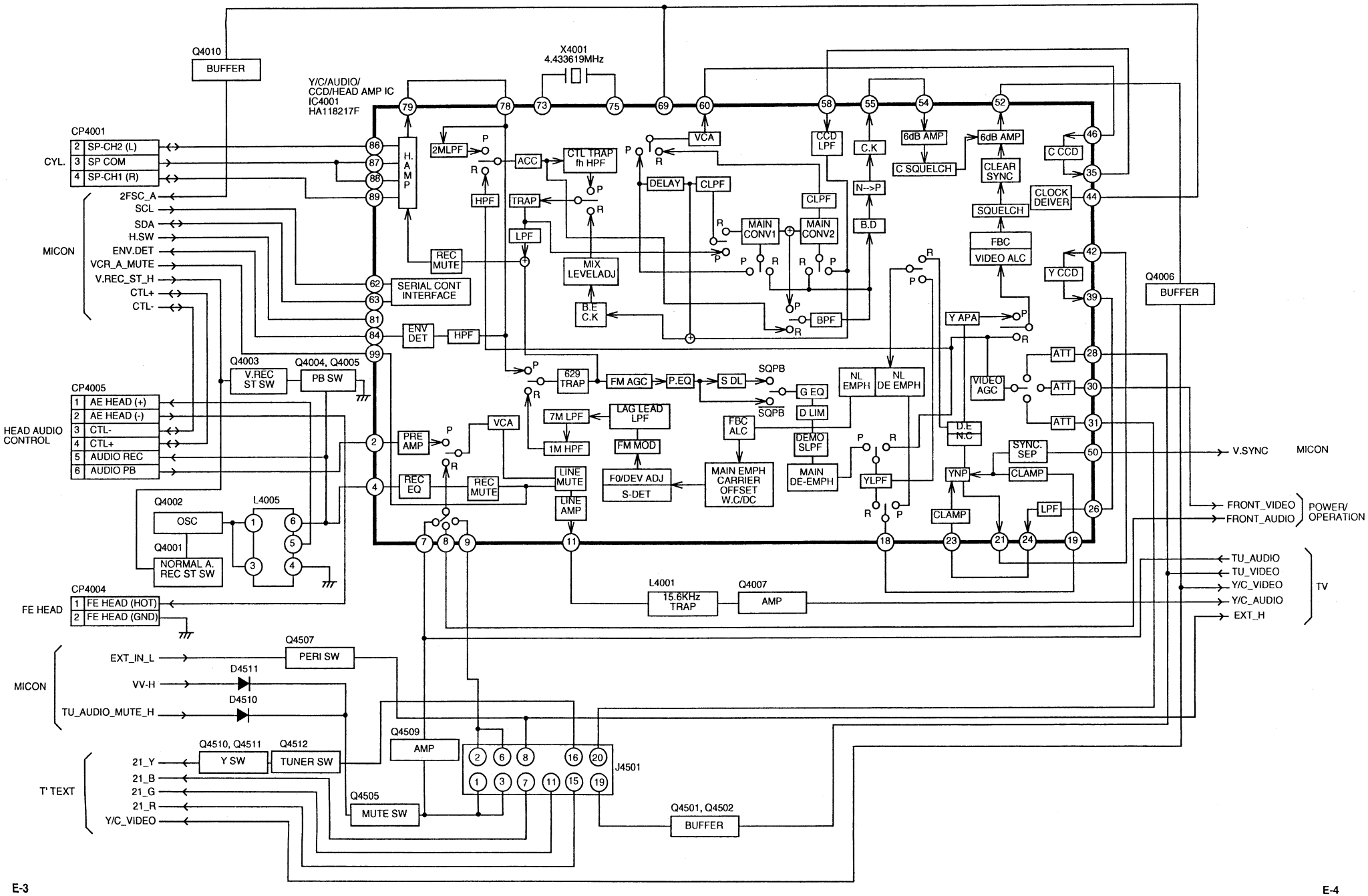
4. ELECTRICAL ADJUSTMENT PARTS LOCATION GUIDE (WIRING CONNECTION)



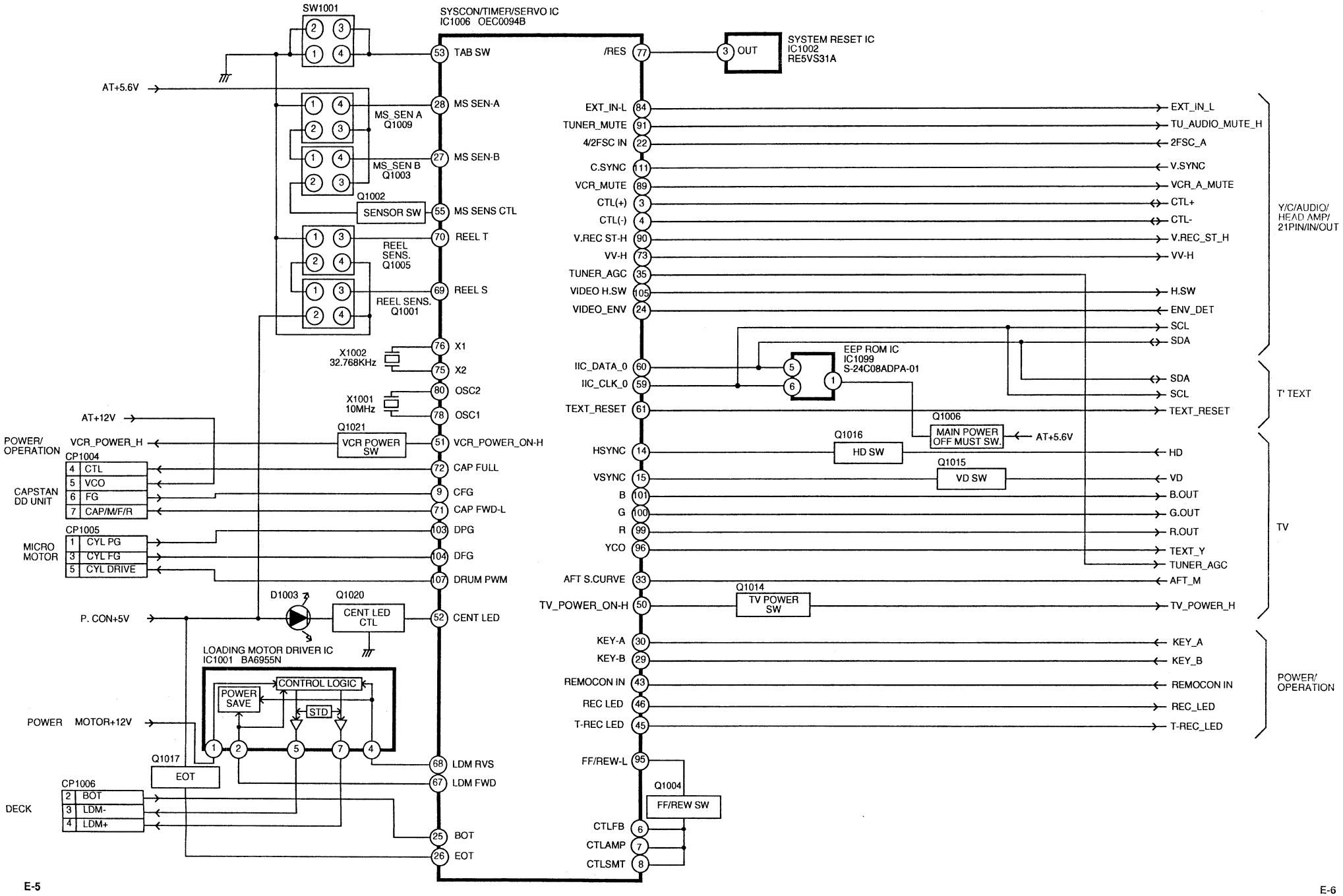
TV BLOCK DIAGRAM



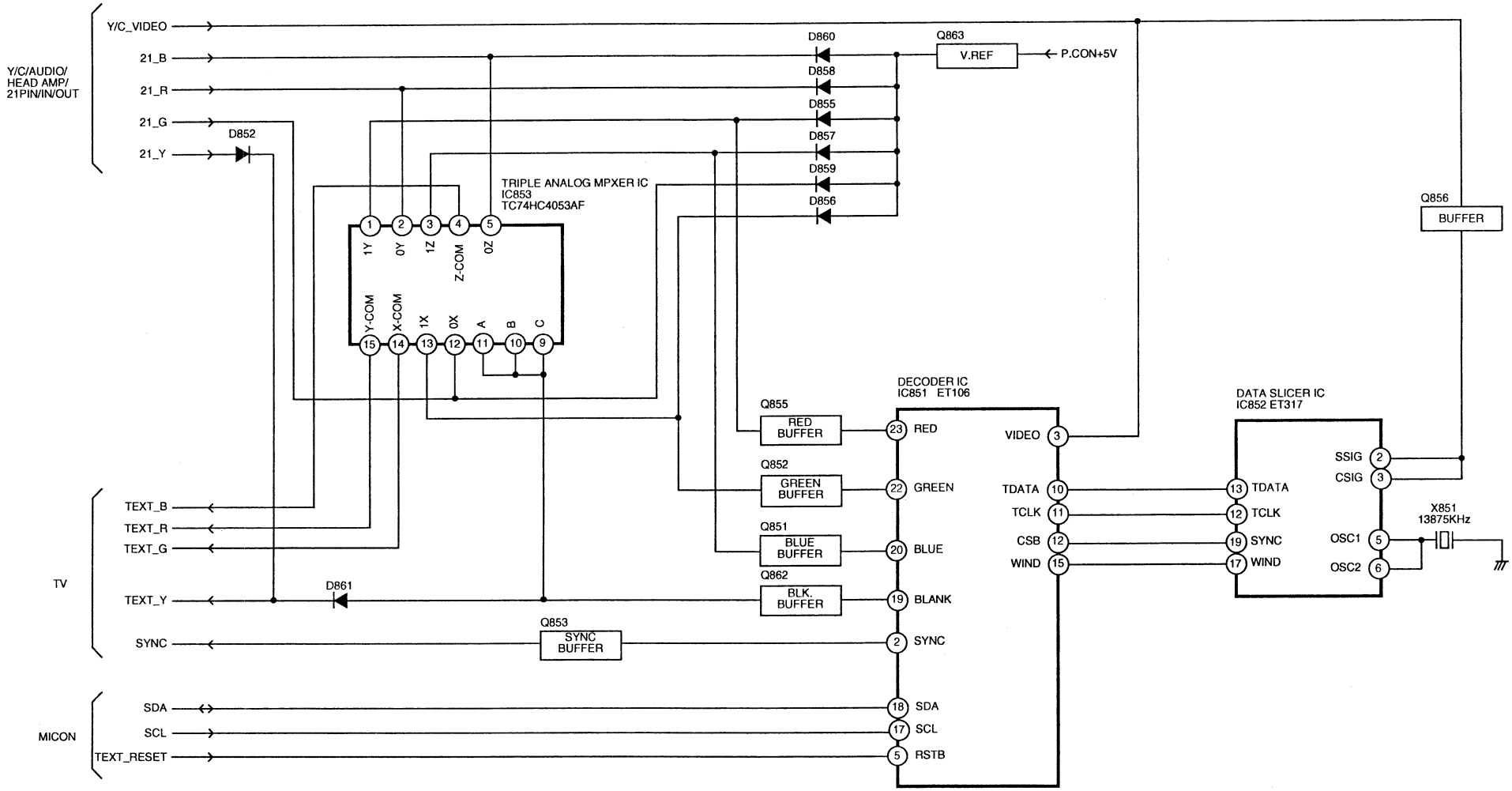
Y/C/AUDIO/HEAD AMP/21PIN/IN/OUT BLOCK DIAGRAM



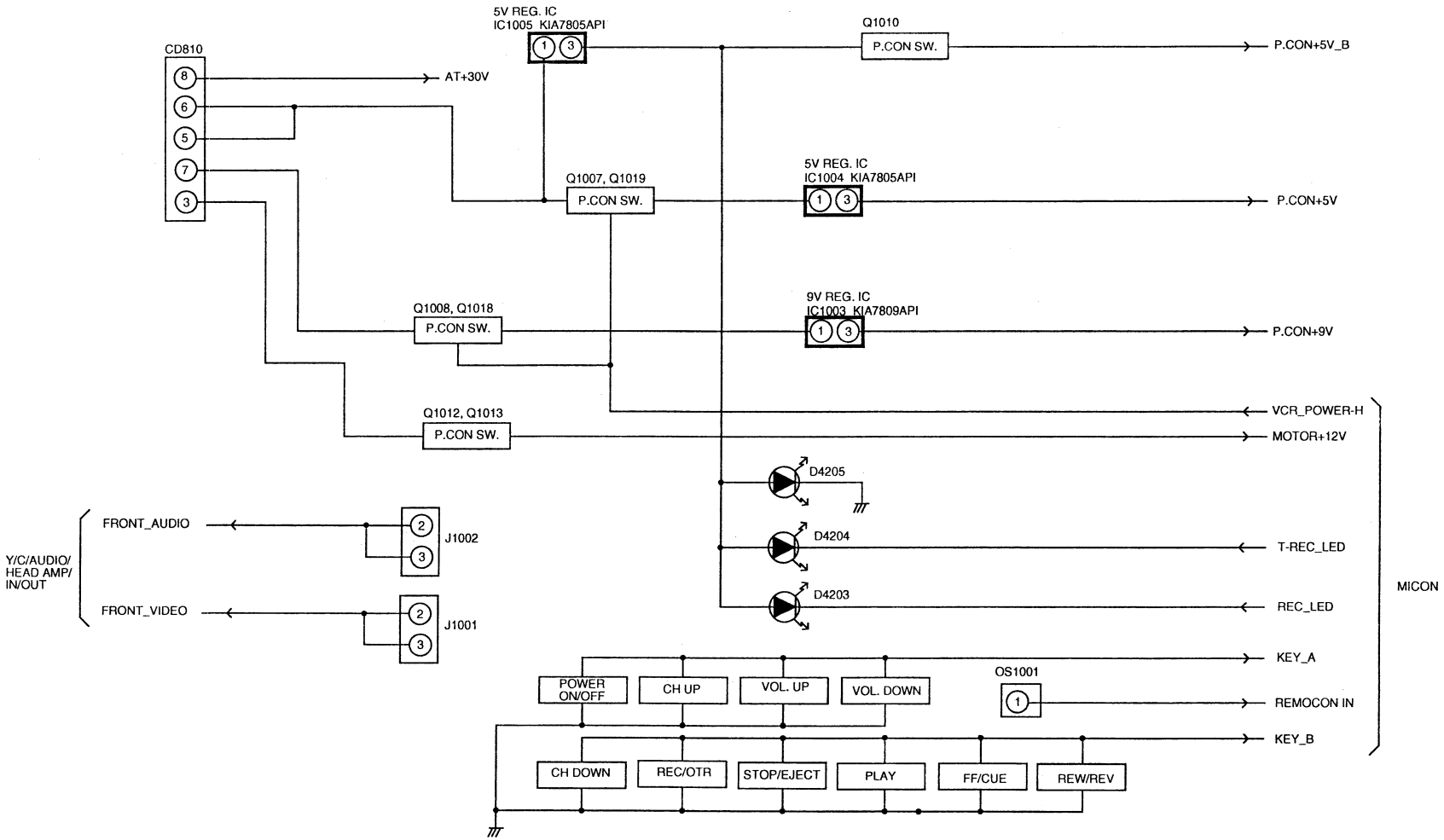
MICON BLOCK DIAGRAM



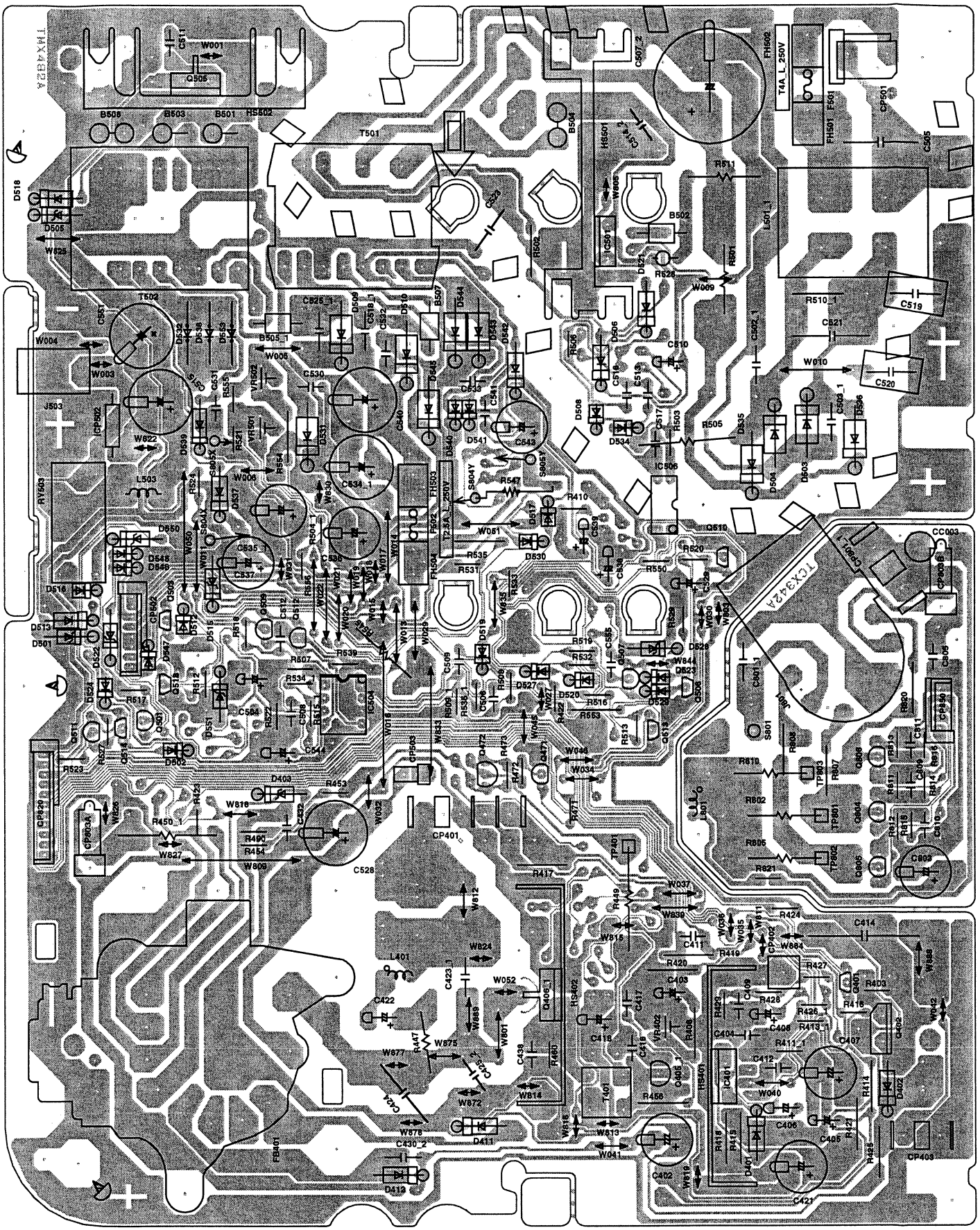
T' TEXT BLOCK DIAGRAM



POWER/OPERATION BLOCK DIAGRAM

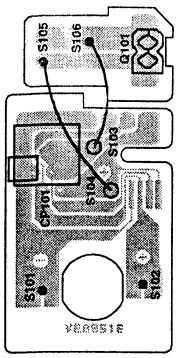


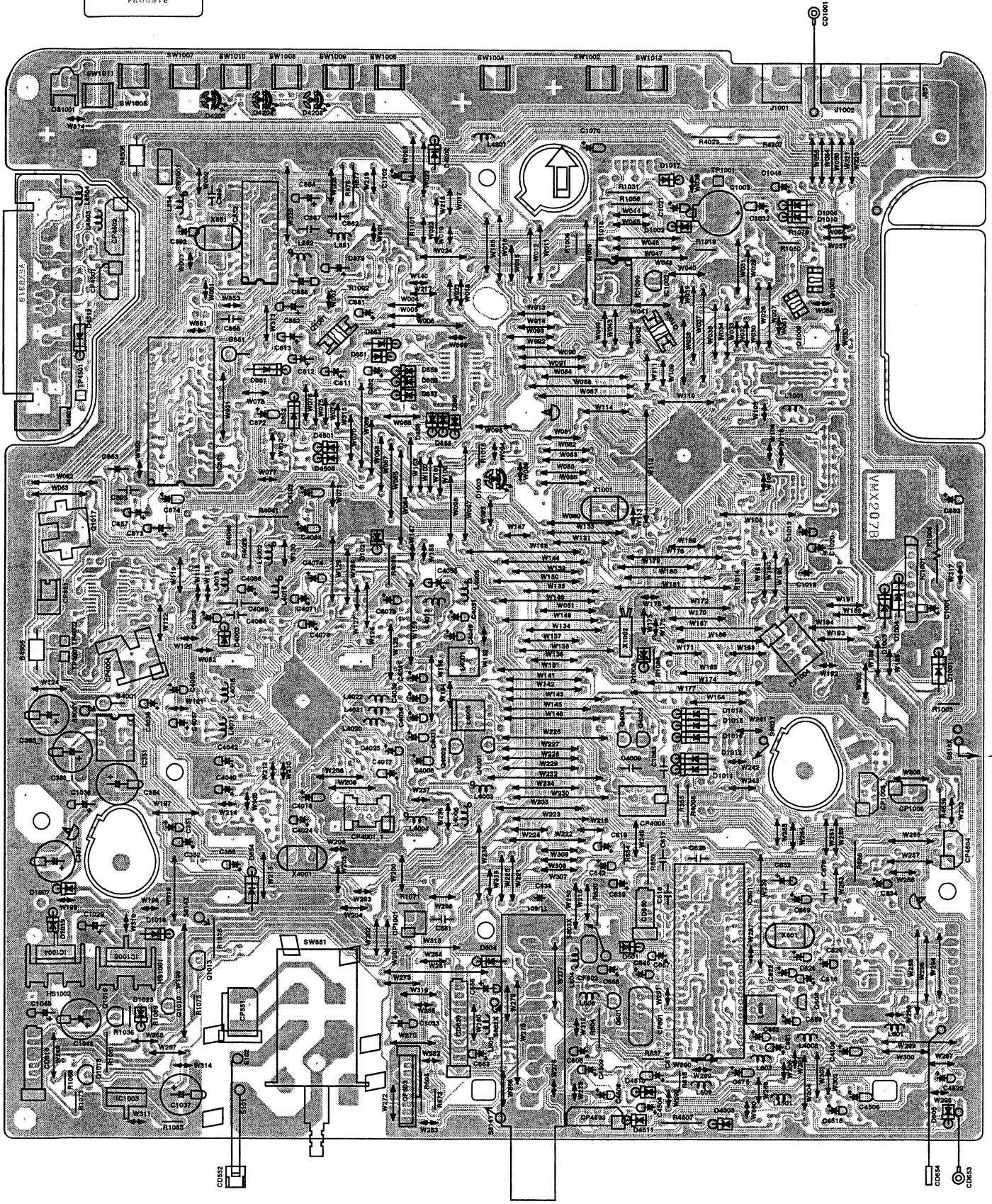
PRINTED CIRCUIT BOARDS
MAIN/CRT
SOLDER SIDE



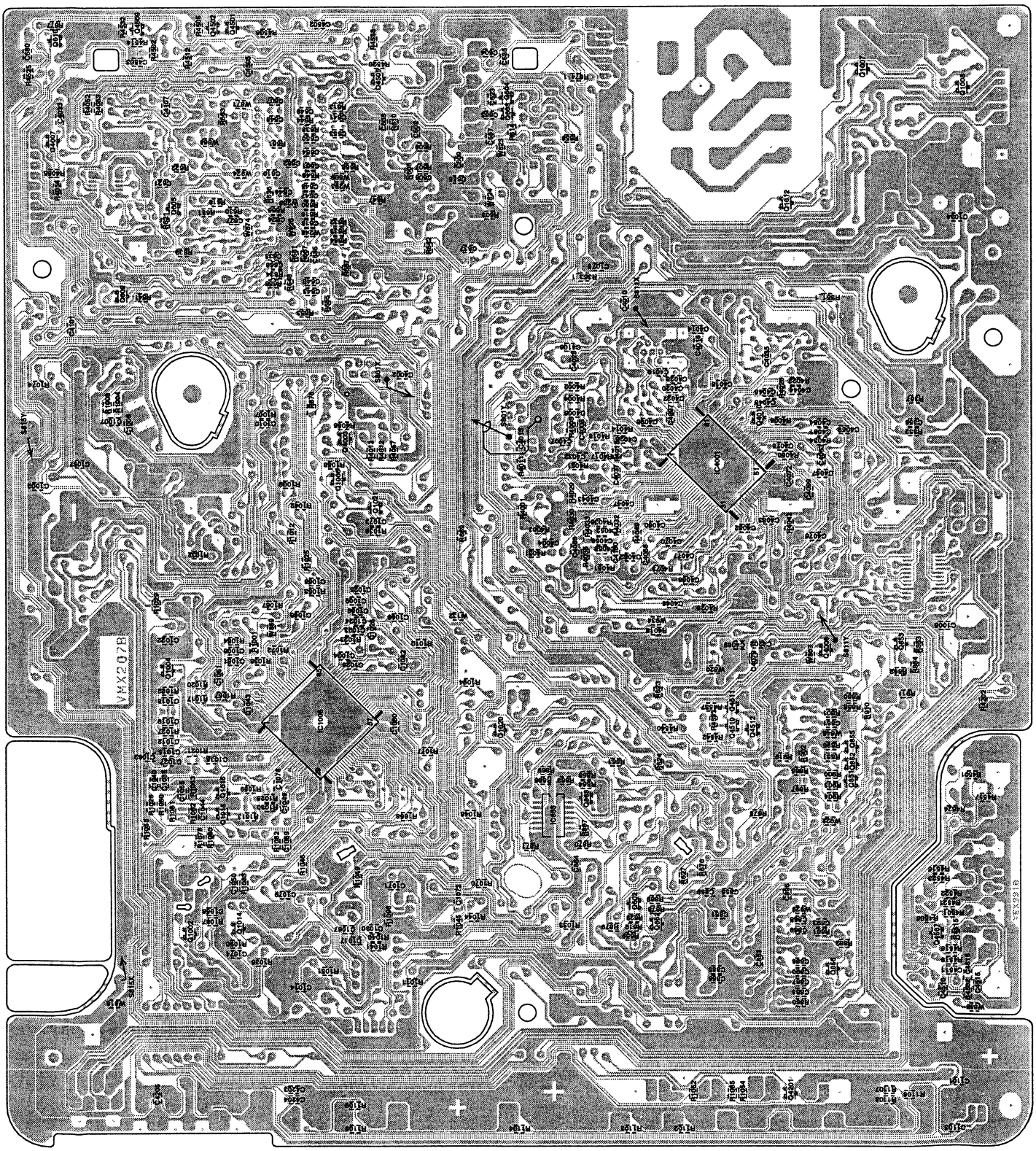
PRINTED CIRCUIT BOARDS
SYSCON/21PIN (INSERTED PARTS)
SOLDER SIDE

DECK
SOLDER SIDE



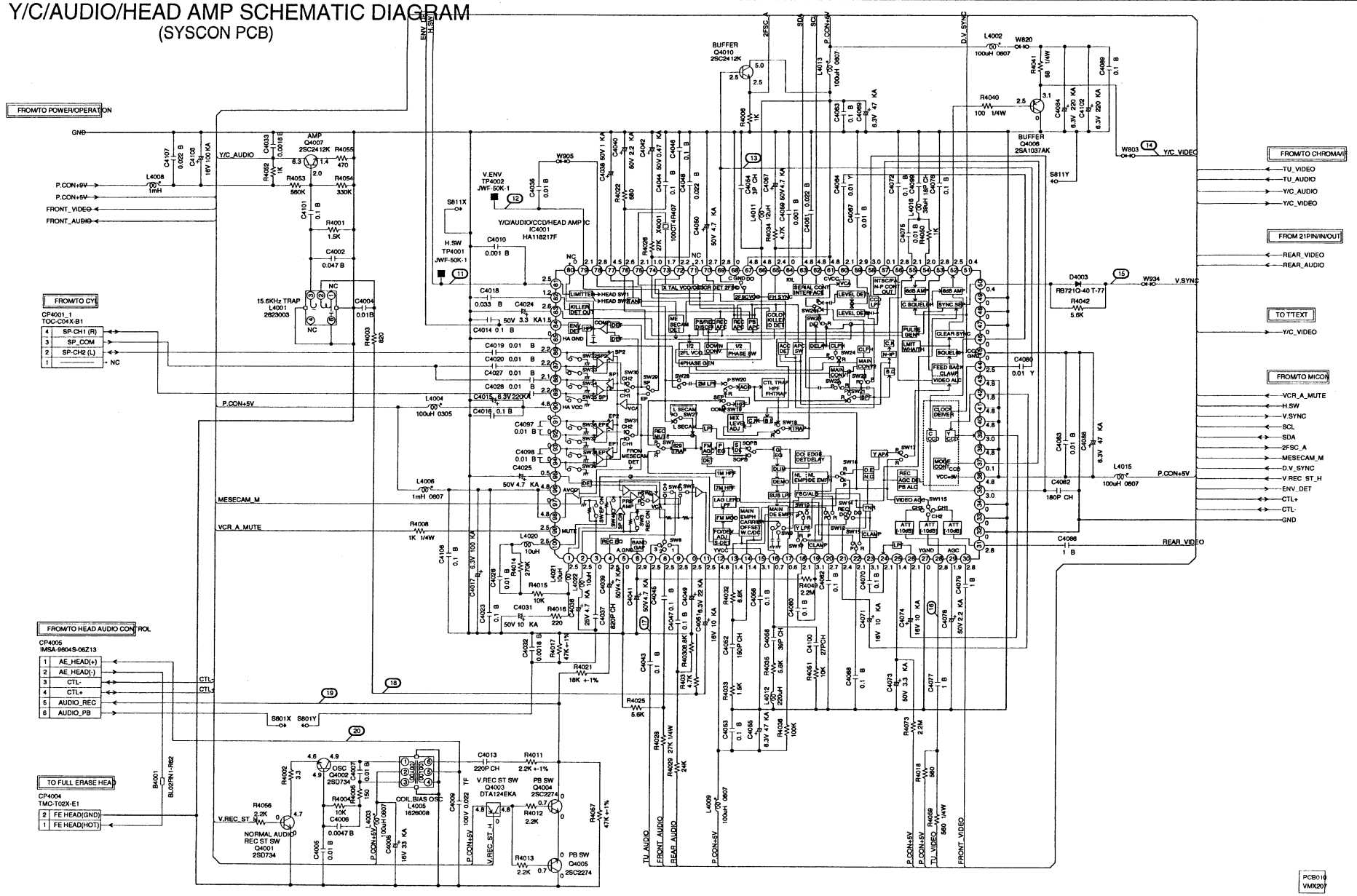


PRINTED CIRCUIT BOARDS
SYSCON/21PIN (CHIP MOUNTED PARTS)
SOLDER SIDE

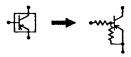


Y/C/AUDIO/HEAD AMP SCHEMATIC DIAGRAM

(SYSCON PCB)



CAUTION: DIGITAL TRANSISTOR

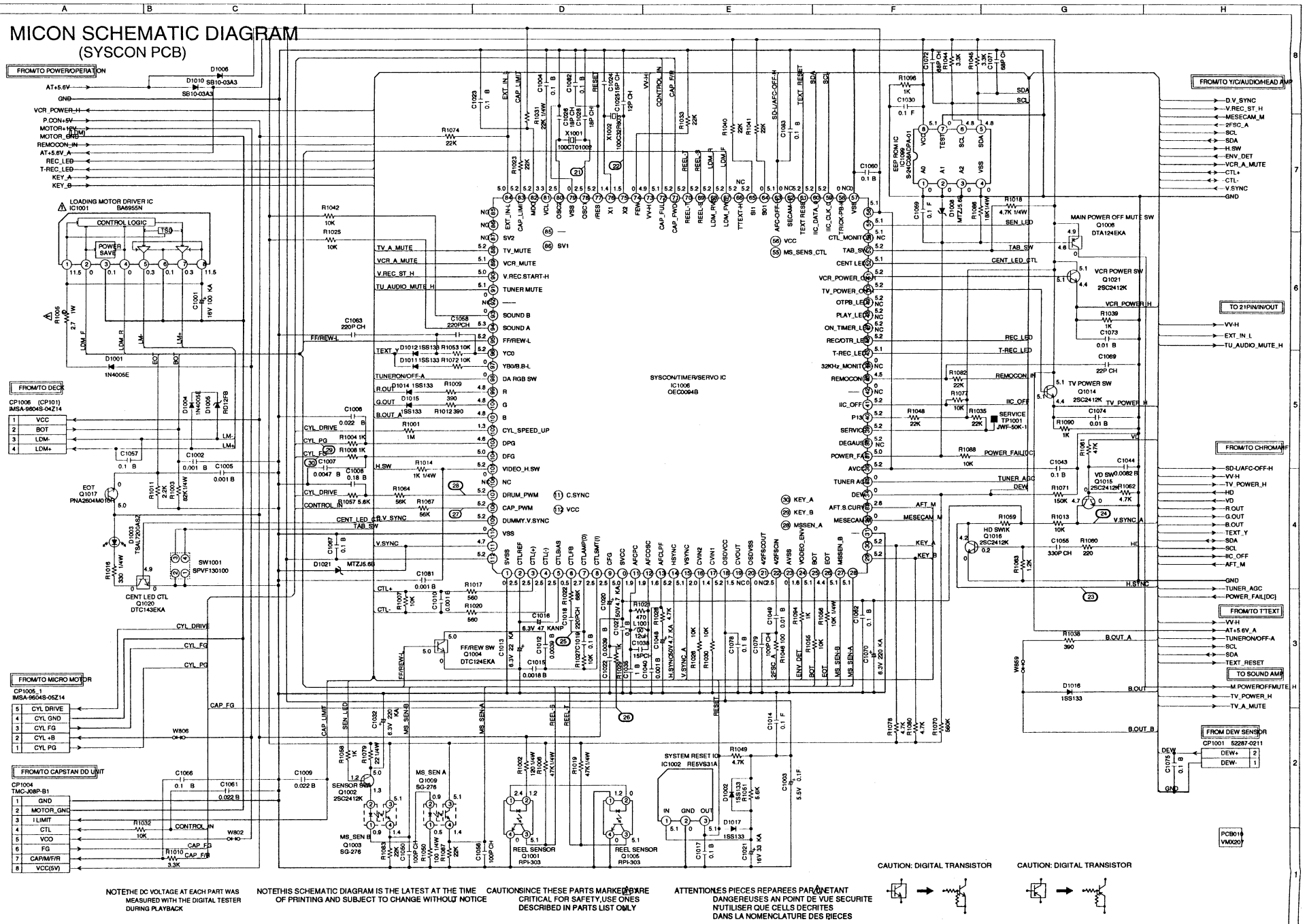


NOTE: THE DC VOLTAGE AT EACH PART WAS MEASURED WITH THE DIGITAL TESTER DURING PLAYBACK

NOTE: THIS SCHEMATIC DIAGRAM IS THE LATEST AT THE TIME OF PRINTING AND SUBJECT TO CHANGE WITHOUT NOTICE

MICON SCHEMATIC DIAGRAM

(SYSCON PCB)



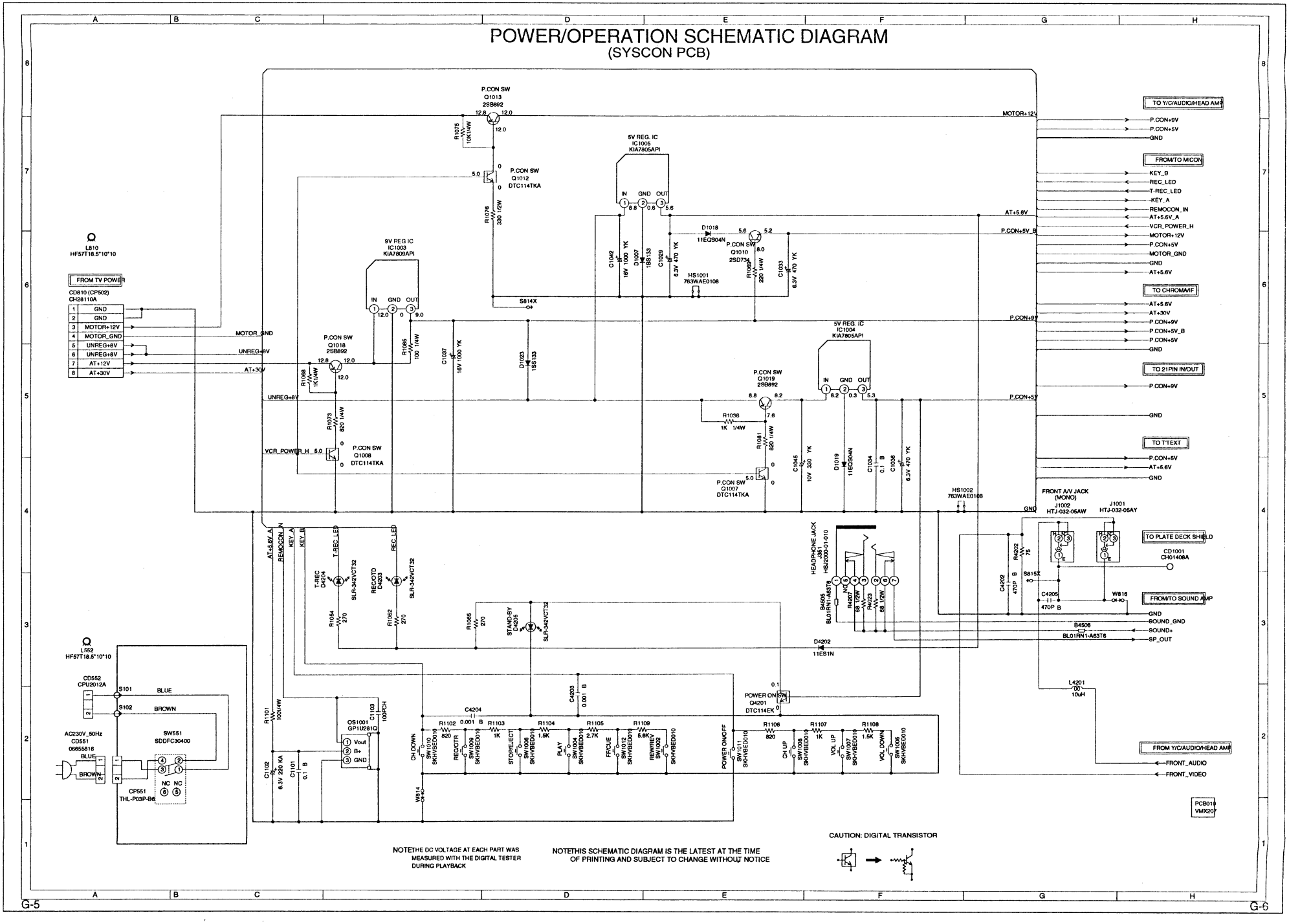
NOTE: THE DC VOLTAGE AT EACH PART WAS MEASURED WITH THE DIGITAL TESTER DURING PLAYBACK

NOTE: THIS SCHEMATIC DIAGRAM IS THE LATEST AT THE TIME OF PRINTING AND SUBJECT TO CHANGE WITHOUT NOTICE

CAUTION: SINCE THESE PARTS MARKED ⚠ ARE CRITICAL FOR SAFETY, USE ONES DESCRIBED IN PARTS LIST ONLY

ATTENTION: LES PIECES REPAREES PAR ⚠ NE TANT DANGEREUSES AN POINT DE VUE SECURITE N'UTILISER QUE CELLS DECRITES DANS LA NOMENCLATURE DES PIECES

POWER/OPERATION SCHEMATIC DIAGRAM
(SYSCON PCB)



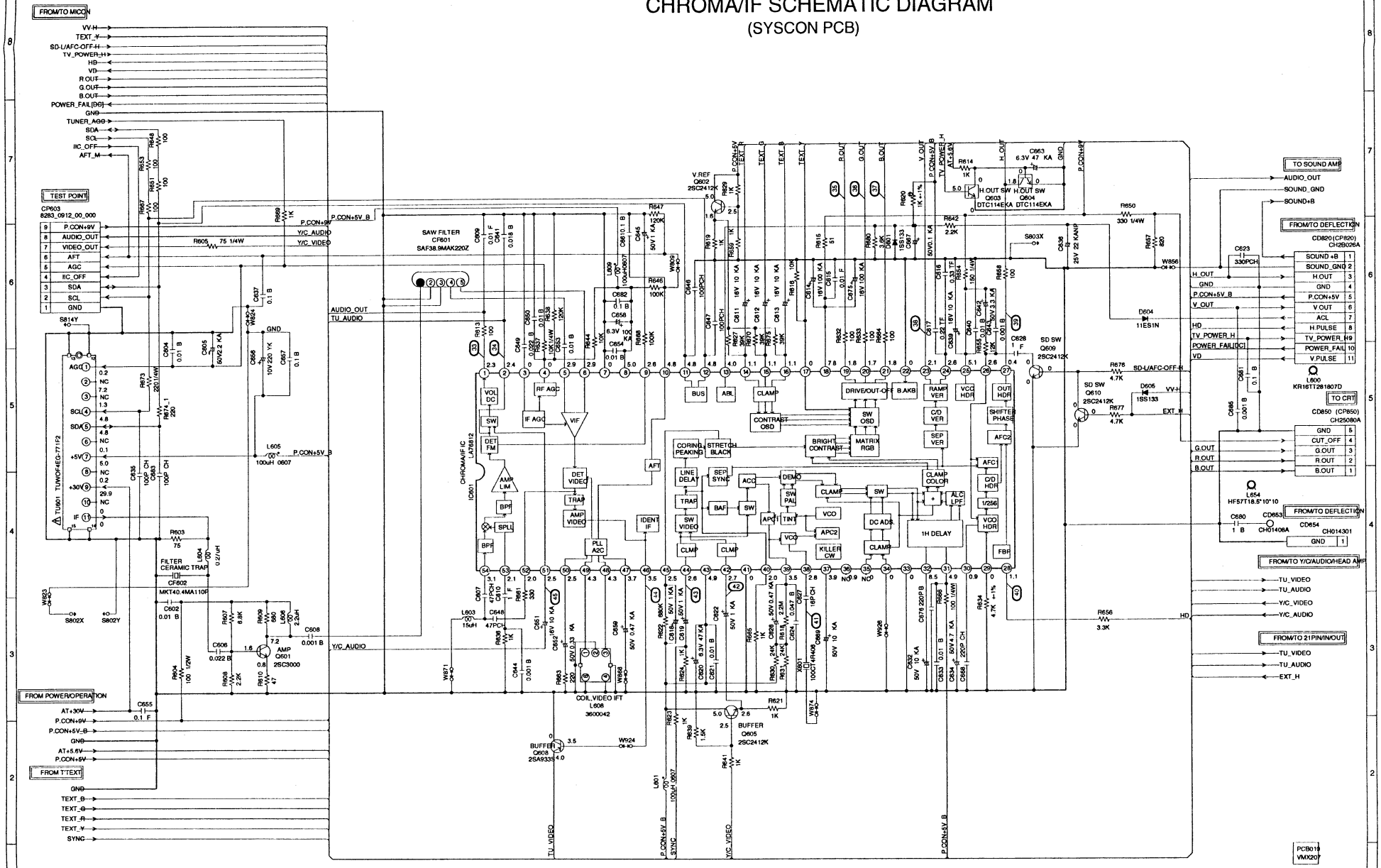
NOTE THE DC VOLTAGE AT EACH PART WAS MEASURED WITH THE DIGITAL TESTER DURING PLAYBACK

NOTE THIS SCHEMATIC DIAGRAM IS THE LATEST AT THE TIME OF PRINTING AND SUBJECT TO CHANGE WITHOUT NOTICE

CAUTION: DIGITAL TRANSISTOR

CHROMA/IF SCHEMATIC DIAGRAM

(SYSCON PCB)



NOTE: THE DC VOLTAGE AT EACH PART WAS MEASURED WITH THE DIGITAL TESTER DURING PLAYBACK

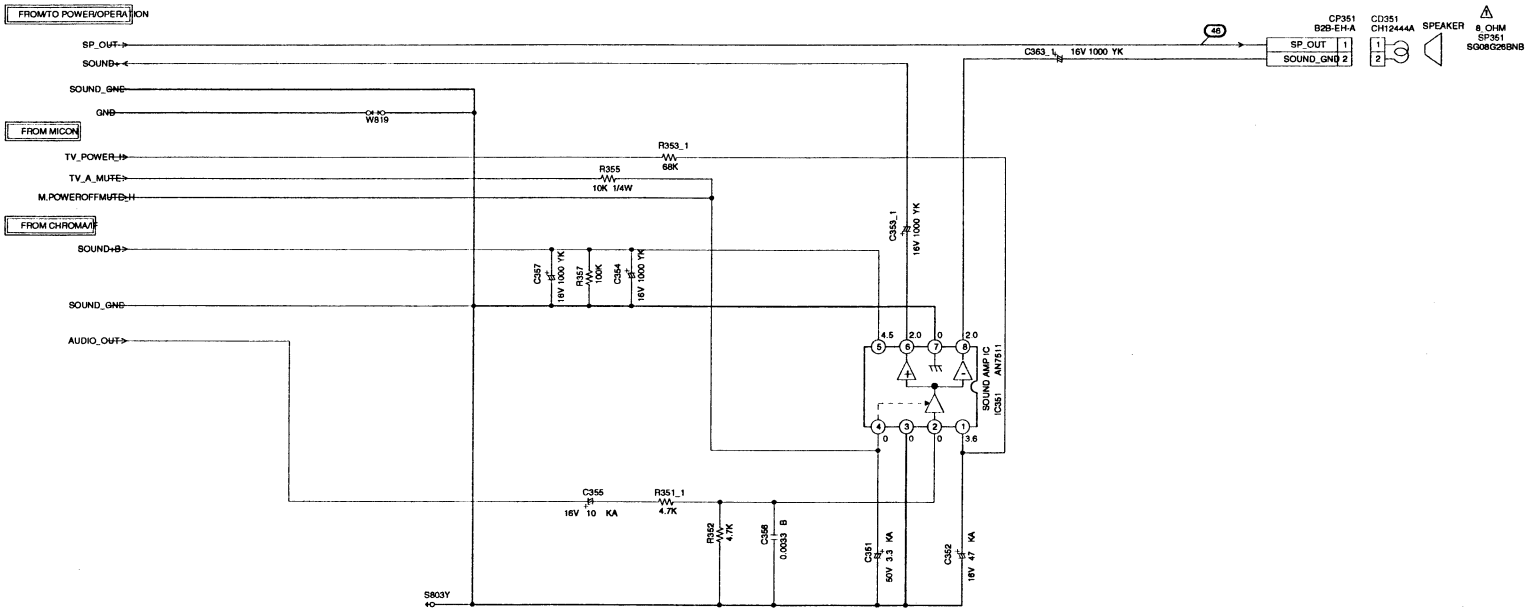
NOTE: THIS SCHEMATIC DIAGRAM IS THE LATEST AT THE TIME OF PRINTING AND SUBJECT TO CHANGE WITHOUT NOTICE

CAUTION: SINCE THESE PARTS MARKED ⚠ ARE CRITICAL FOR SAFETY, USE ONES DESCRIBED IN PARTS LIST ONLY

ATTENTION: LES PIECES REPAREES PAR ⚠ NE TANT DANGEREUSES AN POINT DE VUE SECURITE N'UTILISER QUE CELLS DECRITES DANS LA NOMENCLATURE DES RIECES

CAUTION: DIGITAL TRANSISTOR

SOUND AMP SCHEMATIC DIAGRAM
(SYSCON PCB)



PCB010
VMX207

NOTE: THIS SCHEMATIC DIAGRAM IS THE LATEST AT THE TIME OF PRINTING AND SUBJECT TO CHANGE WITHOUT NOTICE

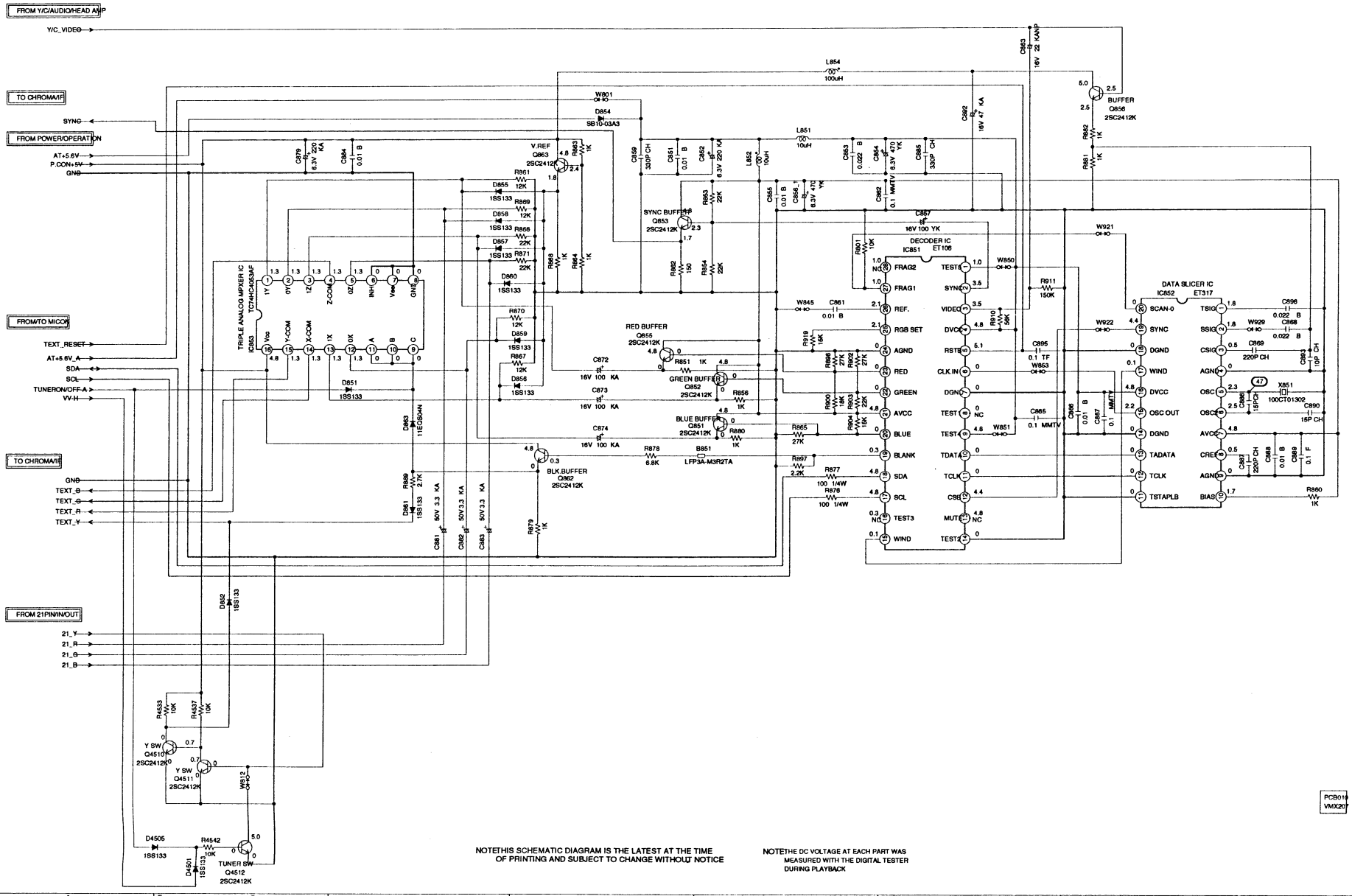
NOTE: THE DC VOLTAGE AT EACH PART WAS MEASURED WITH THE DIGITAL TESTER DURING PLAYBACK

CAUTION: SINCE THESE PARTS MARKED ⚠ ARE CRITICAL FOR SAFETY, USE ONES DESCRIBED IN PARTS LIST ONLY

ATTENTION: LES PIECES REPAREES PAR ⚠ NE TANT DANGEREUSES AN POINT DE VUE SECURITE N'UTILISER QUE CELLS DECRITES DANS LA NOMENCLATURE DES PIECES

T'TEXT SCHEMATIC DIAGRAM

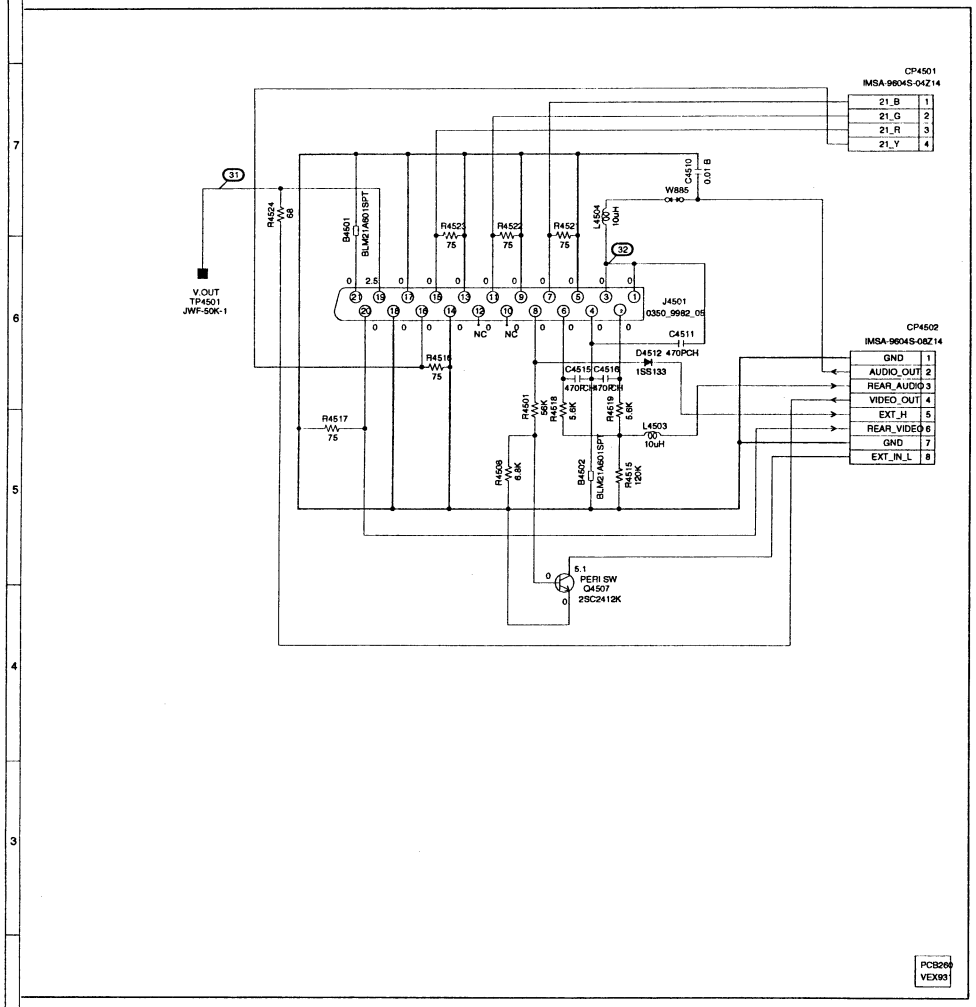
(SYSCON PCB)

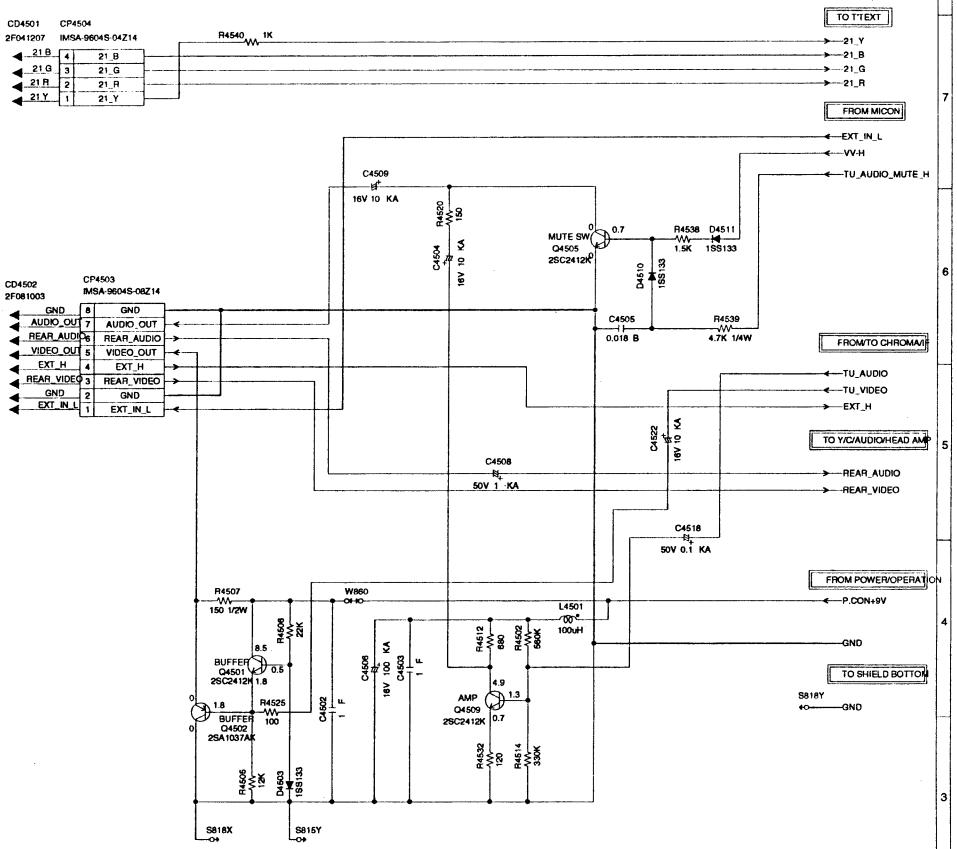


NOTE THIS SCHEMATIC DIAGRAM IS THE LATEST AT THE TIME OF PRINTING AND SUBJECT TO CHANGE WITHOUT NOTICE

NOTE THE DC VOLTAGE AT EACH PART WAS MEASURED WITH THE DIGITAL TESTER DURING PLAYBACK

21PIN/IN/OUT SCHEMATIC DIAGRAM
(SYSCON PCB)



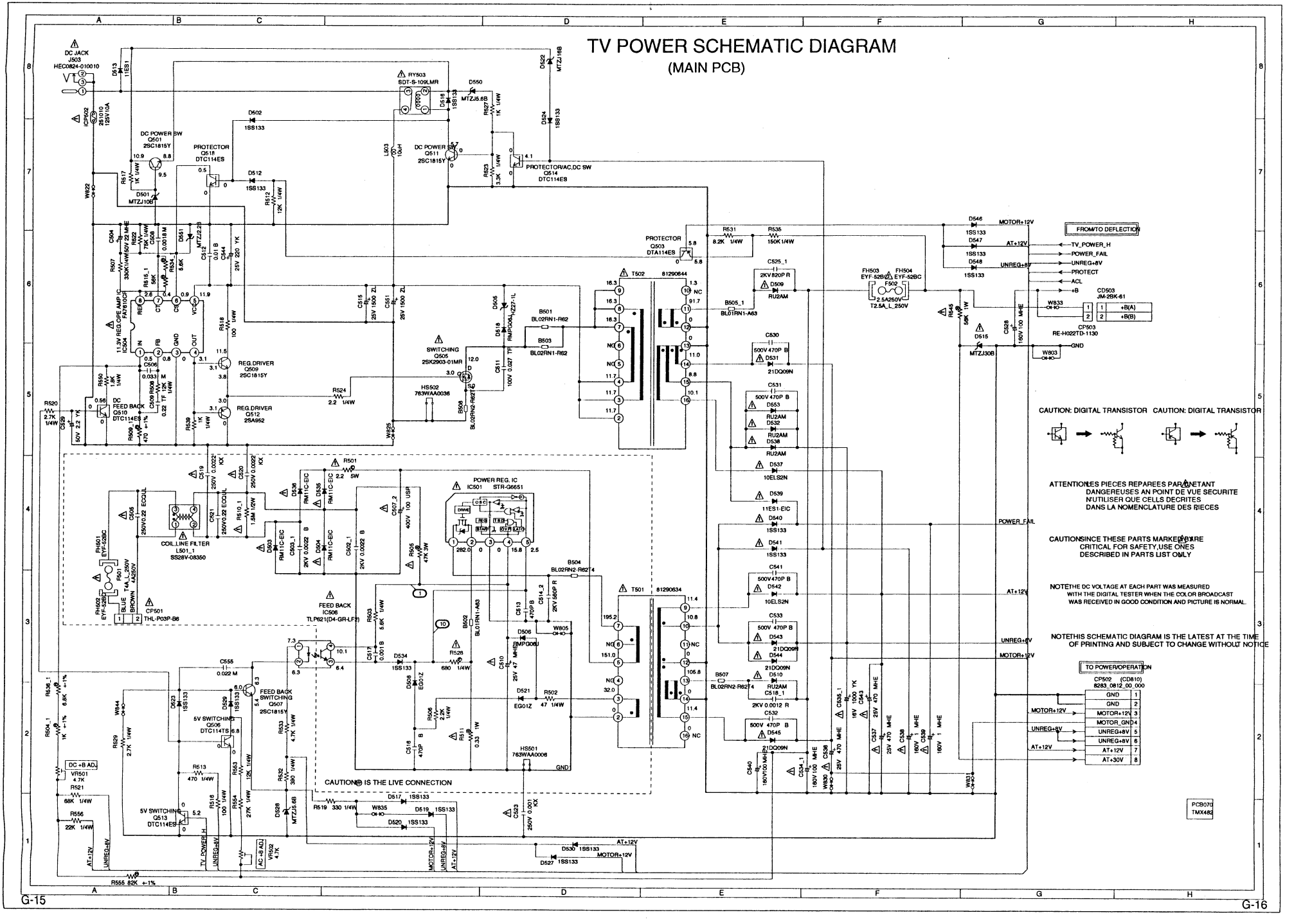


NOTE THE DC VOLTAGE AT EACH PART WAS MEASURED WITH THE DIGITAL TESTER DURING PLAYBACK

NOTE THIS SCHEMATIC DIAGRAM IS THE LATEST AT THE TIME OF PRINTING AND SUBJECT TO CHANGE WITHOUT NOTICE

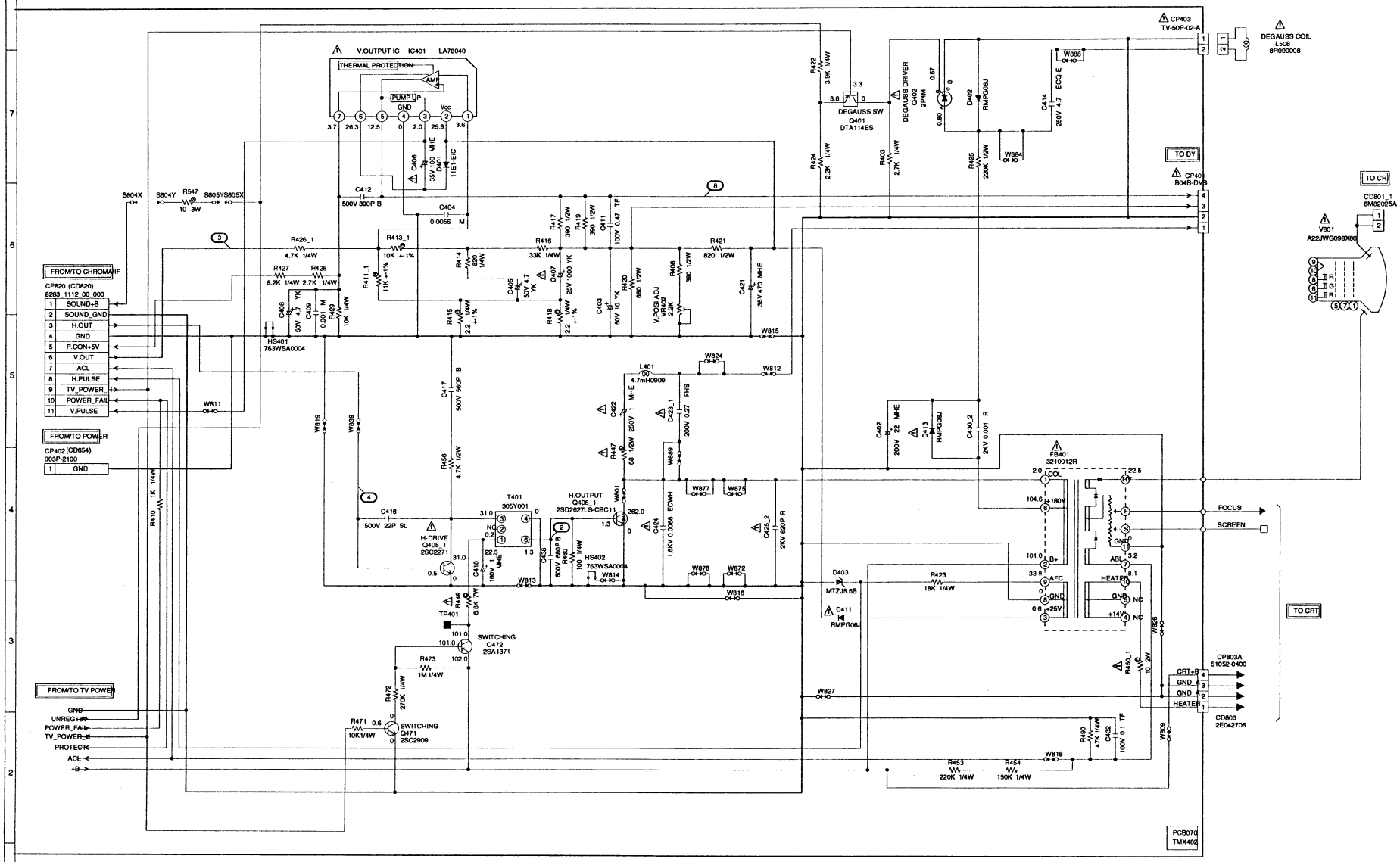
TV POWER SCHEMATIC DIAGRAM

(MAIN PCB)



DEFLECTION SCHEMATIC DIAGRAM

(MAIN PCB)



NOTE: THE DC VOLTAGE AT EACH PART WAS MEASURED WITH THE DIGITAL TESTER WHEN THE COLOR BROADCAST WAS RECEIVED IN GOOD CONDITION AND PICTURE IS NORMAL.

NOTE: THIS SCHEMATIC DIAGRAM IS THE LATEST AT THE TIME OF PRINTING AND SUBJECT TO CHANGE WITHOUT NOTICE

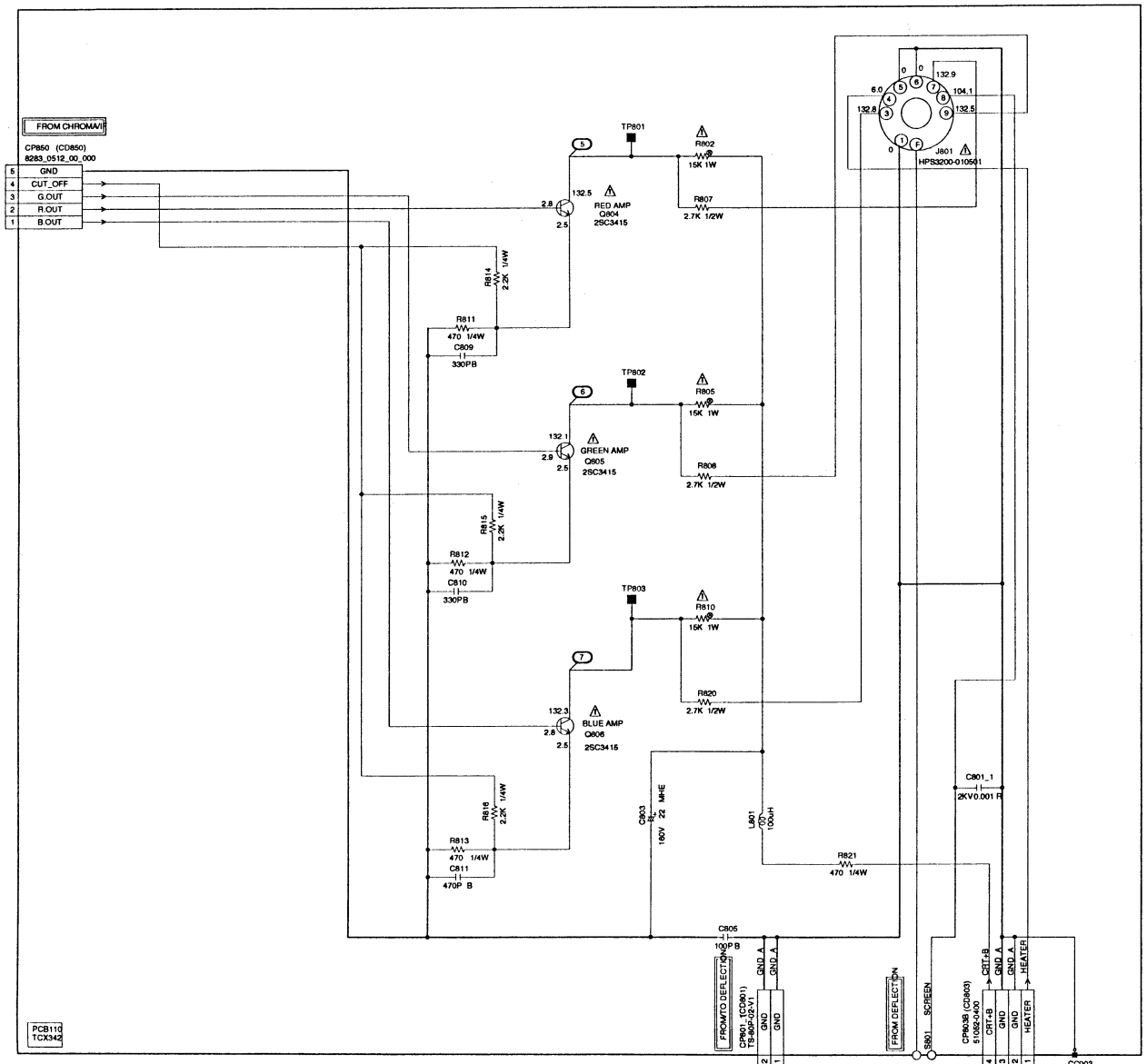
ATTENTION: LES PIECES REPAREES PAR ⚠ NE TANT DANGEREUSES AN POINT DE VUE SECURITE N'UTILISER QUE CELLS DECRITES DANS LA NOMENCLATURE DES PIECES

CAUTION: SINCE THESE PARTS MARKED ⚠ ARE CRITICAL FOR SAFETY, USE ONES DESCRIBED IN PARTS LIST ONLY

CAUTION: DIGITAL TRANSISTOR

CRT SCHEMATIC DIAGRAM

(CRT PCB)



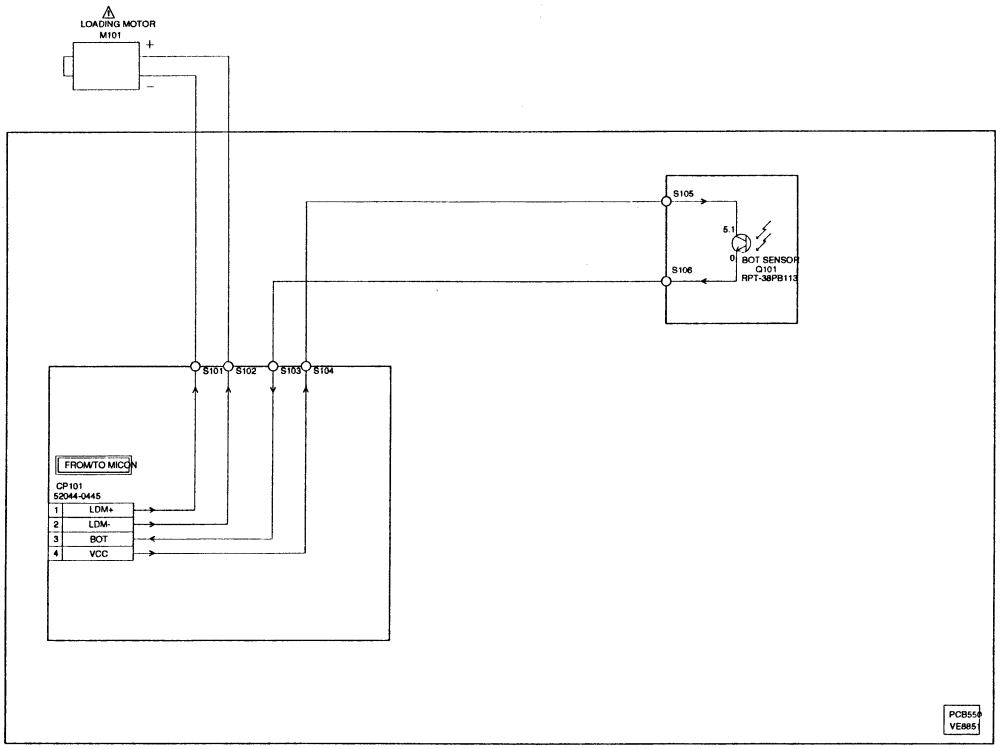
CAUTION: SINCE THESE PARTS MARKED ⚠ ARE CRITICAL FOR SAFETY, USE ONES DESCRIBED IN PARTS LIST ONLY

ATTENTION: LES PIECES REPAREES PAR ⚠ ETANT DANGEREUSES AN POINT DE VUE SECURITE N'UTILISER QUE CELLS DECRITES DANS LA NOMENCLATURE DES PIECES

NOTE: THIS SCHEMATIC DIAGRAM IS THE LATEST AT THE TIME OF PRINTING AND SUBJECT TO CHANGE WITHOUT NOTICE

NOTE: THE DC VOLTAGE AT EACH PART WAS MEASURED WITH THE DIGITAL TESTER WHEN THE COLOR BROADCAST WAS RECEIVED IN GOOD CONDITION AND PICTURE IS NORMAL.

DECK SCHEMATIC DIAGRAM
(DECK PCB)



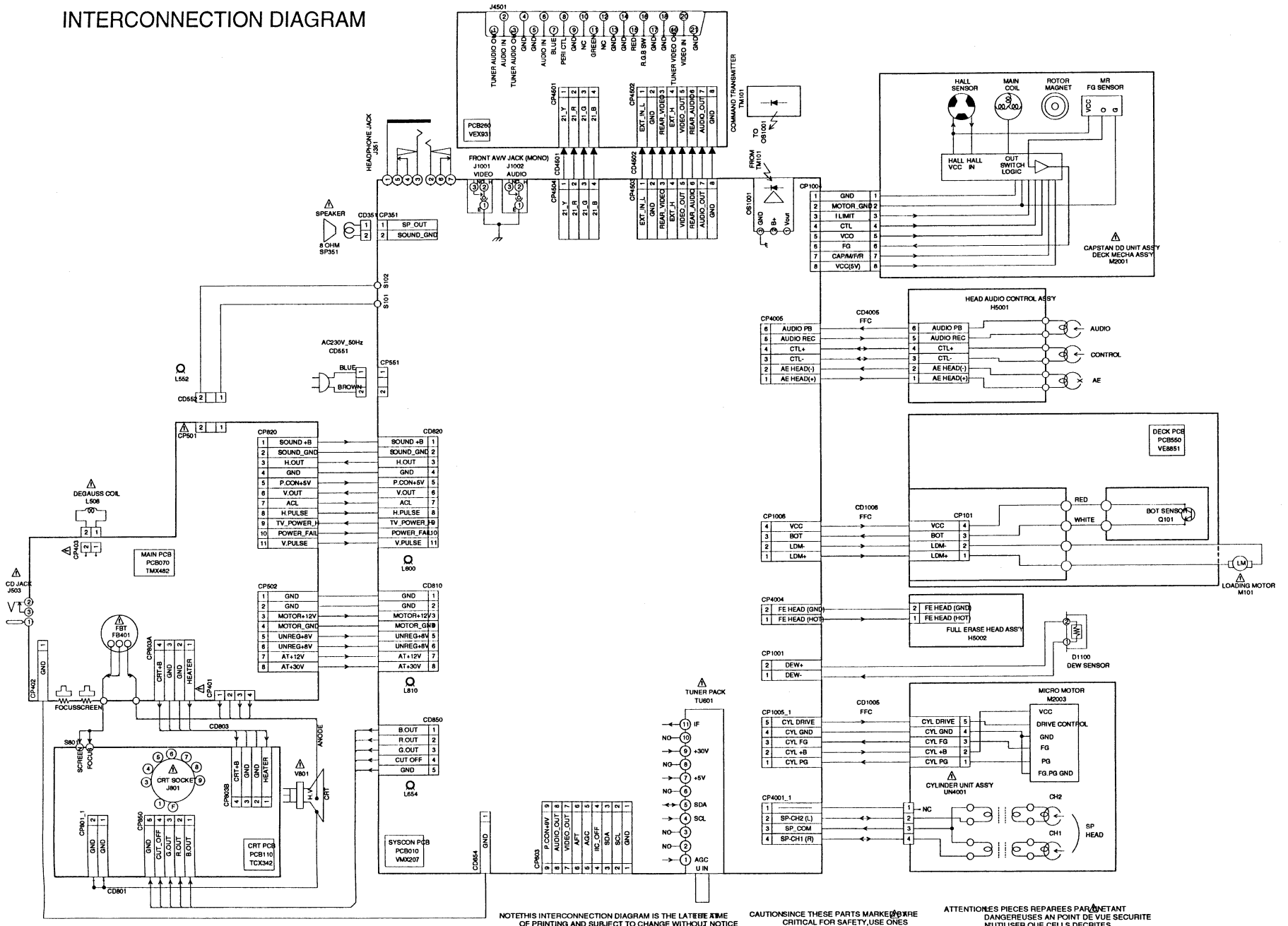
CAUTION: SINCE THESE PARTS MARKED ⚠ ARE CRITICAL FOR SAFETY, USE ONES DESCRIBED IN PARTS LIST ONLY

ATTENTION: LES PIECES REPAREES PAR ⚠ SONT DANGEREUSES AN POINT DE VUE SECURITE N'UTILISER QUE CELLS DECRITES DANS LA NOMENCLATURE DES PIECES

NOTE: THE DC VOLTAGE AT EACH PART WAS MEASURED WITH THE DIGITAL TESTER DURING PLAYBACK

NOTE: THIS SCHEMATIC DIAGRAM IS THE LATEST AT THE TIME OF PRINTING AND SUBJECT TO CHANGE WITHOUT NOTICE

INTERCONNECTION DIAGRAM



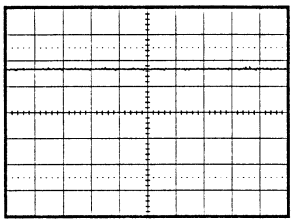
NOTE THIS INTERCONNECTION DIAGRAM IS THE LATEST AT THE TIME OF PRINTING AND SUBJECT TO CHANGE WITHOUT NOTICE

CAUTION SINCE THESE PARTS MARKED ⚠ ARE CRITICAL FOR SAFETY, USE ONES DESCRIBED IN PARTS LIST ONLY

ATTENTION LES PIECES REPAREES PAR ⚠ NETANT DANGEREUSES AN POINT DE VUE SECURITE N'UTILISER QUE CELLS DECRITES DANS LA NOMENCLATURE DES RIECES

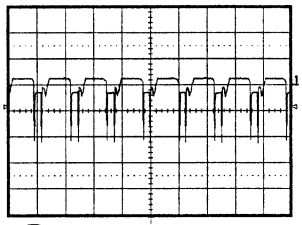
WAVEFORMS

TV POWER

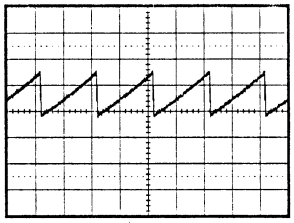


① 5V 0.1ms/div

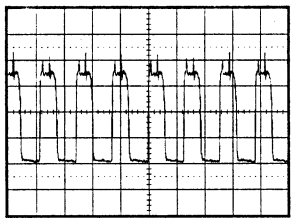
DEFLECTION



② 5V 50µs/div

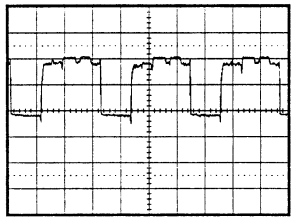


③ 0.5V 10ms/div

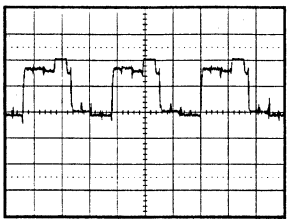


④ 200mV 50µs/div

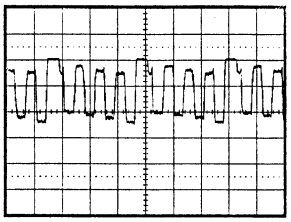
CRT



⑤ 2V 20µs/div

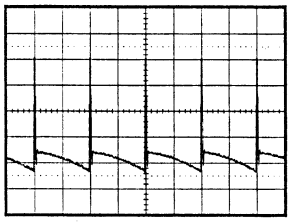


⑥ 20V 20µs/div



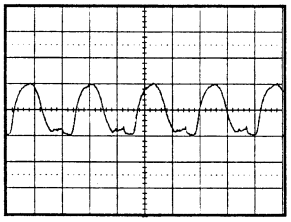
⑦ 20V 20µs/div

DEFLECTION



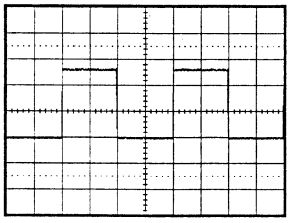
⑧ 10V 10ms/div

TV POWER

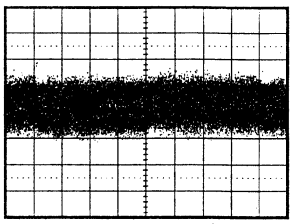


⑩ 2V 5µs/div

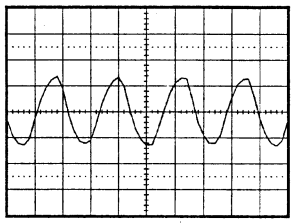
Y/C/AUDIO/HEAD AMP



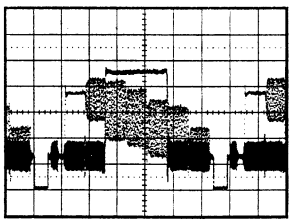
⑪ PB
2V 10ms/div



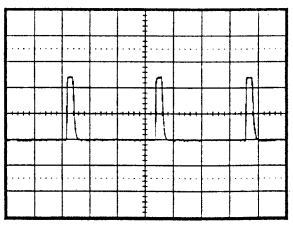
⑫ PB
10mV 5ms/div



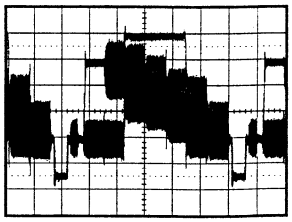
⑬ POWER ON
200mV 50ns/div



⑭ POWER ON
0.5V 10µs/div



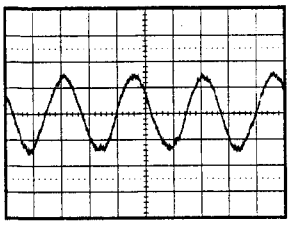
⑮ POWER ON
2V 20µs/div



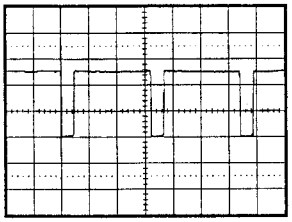
⑯ POWER ON
200mV 10µs/div

NOTE: The following waveforms were measured at the point of the corresponding balloon number in the schematic diagram.

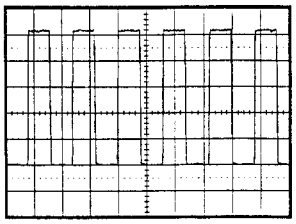
WAVEFORMS



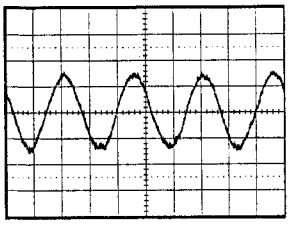
⑰ POWER ON
50mV 1ms/div



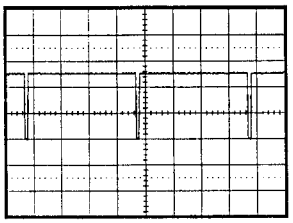
㉒ POWER ON
1V 20μs/div



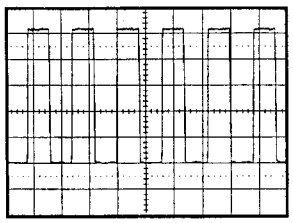
㉗ PB
1V 0.5μs/div



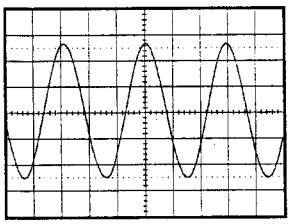
⑱ POWER ON
50mV 1ms/div



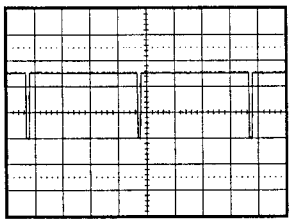
㉓ POWER ON
2V 20μs/div



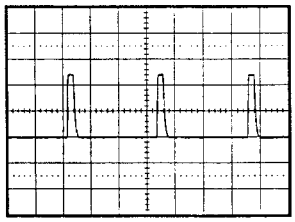
㉘ PB
1V 0.5μs/div



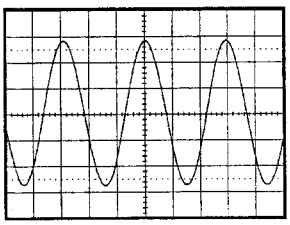
⑲ REC
10V 5μs/div



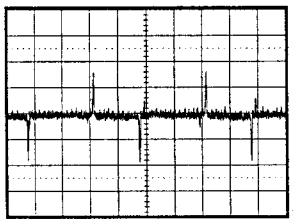
㉔ POWER ON
2V 5ms/div



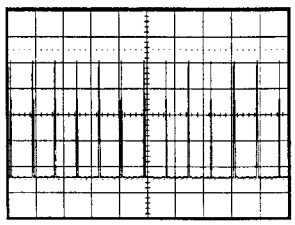
㉙ PB
2V 20μs/div



⑳ REC
10V 5μs/div

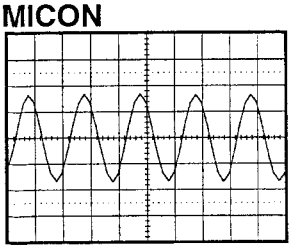


㉕ PB
50mV 10ms/div

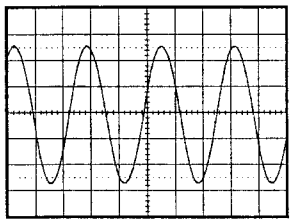


㉚ PB
1V 50ms/div

MICON

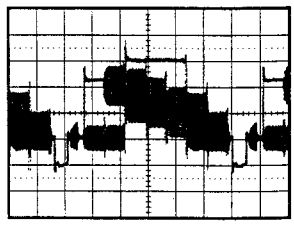


㉑ POWER ON
1V 50ns/div



㉖ PB
50mV 0.5ms/div

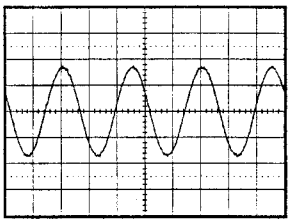
21PIN/IN/OUT



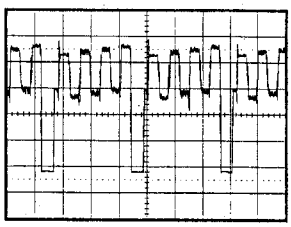
㉛ POWER ON
0.5V 10μs/div

NOTE: The following waveforms were measured at the point of the corresponding balloon number in the schematic diagram.

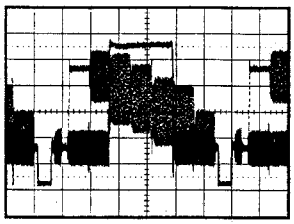
WAVEFORMS



(32) POWER ON
20mV 1ms/div

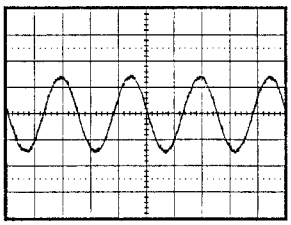


(37) POWER ON
0.5V 20μs/div

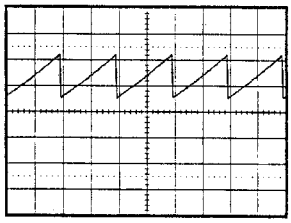


(42) POWER ON
200mV 10μs/div

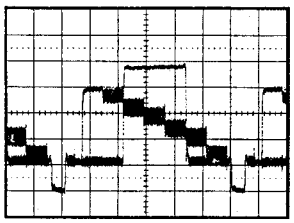
CHROMA/IF



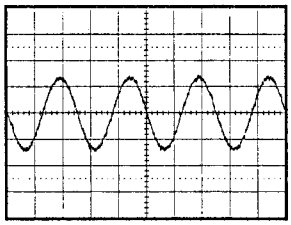
(33) POWER ON
5mV 1ms/div



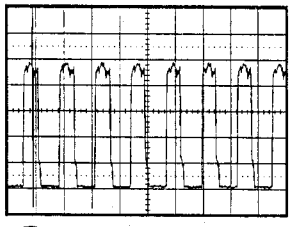
(38) POWER ON
0.5V 10ms/div



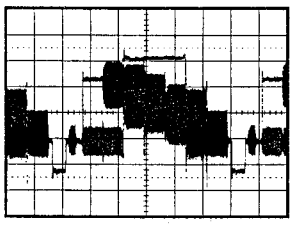
(43) POWER ON
10mV 10μs/div



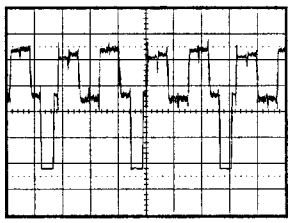
(34) POWER ON
5mV 1ms/div



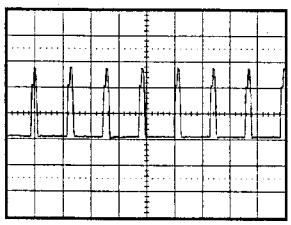
(39) POWER ON
200mV 50μs/div



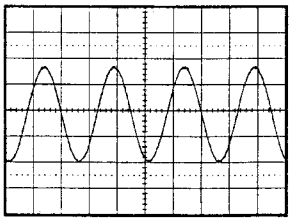
(44) POWER ON
0.5V 10μs/div



(35) POWER ON
0.5V 20μs/div

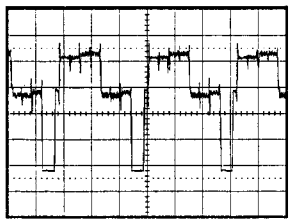


(40) POWER ON
2V 50μs/div

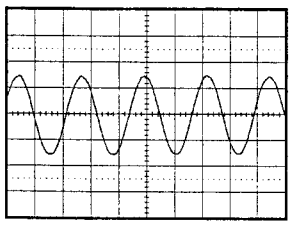


(45) POWER ON
200mV 1ms/div

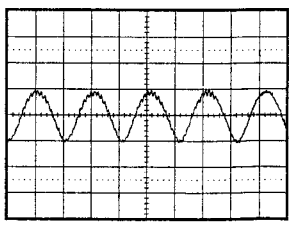
SOUND AMP



(36) POWER ON
0.5V 20μs/div



(41) POWER ON
200mV 0.1μs/div

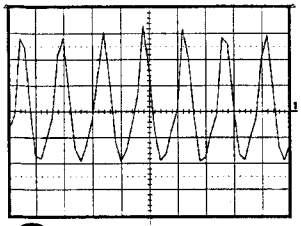


(46) REC
0.5V 0.5ms/

NOTE: The following waveforms were measured at the point of the corresponding balloon number in the schematic diagram.

WAVEFORMS

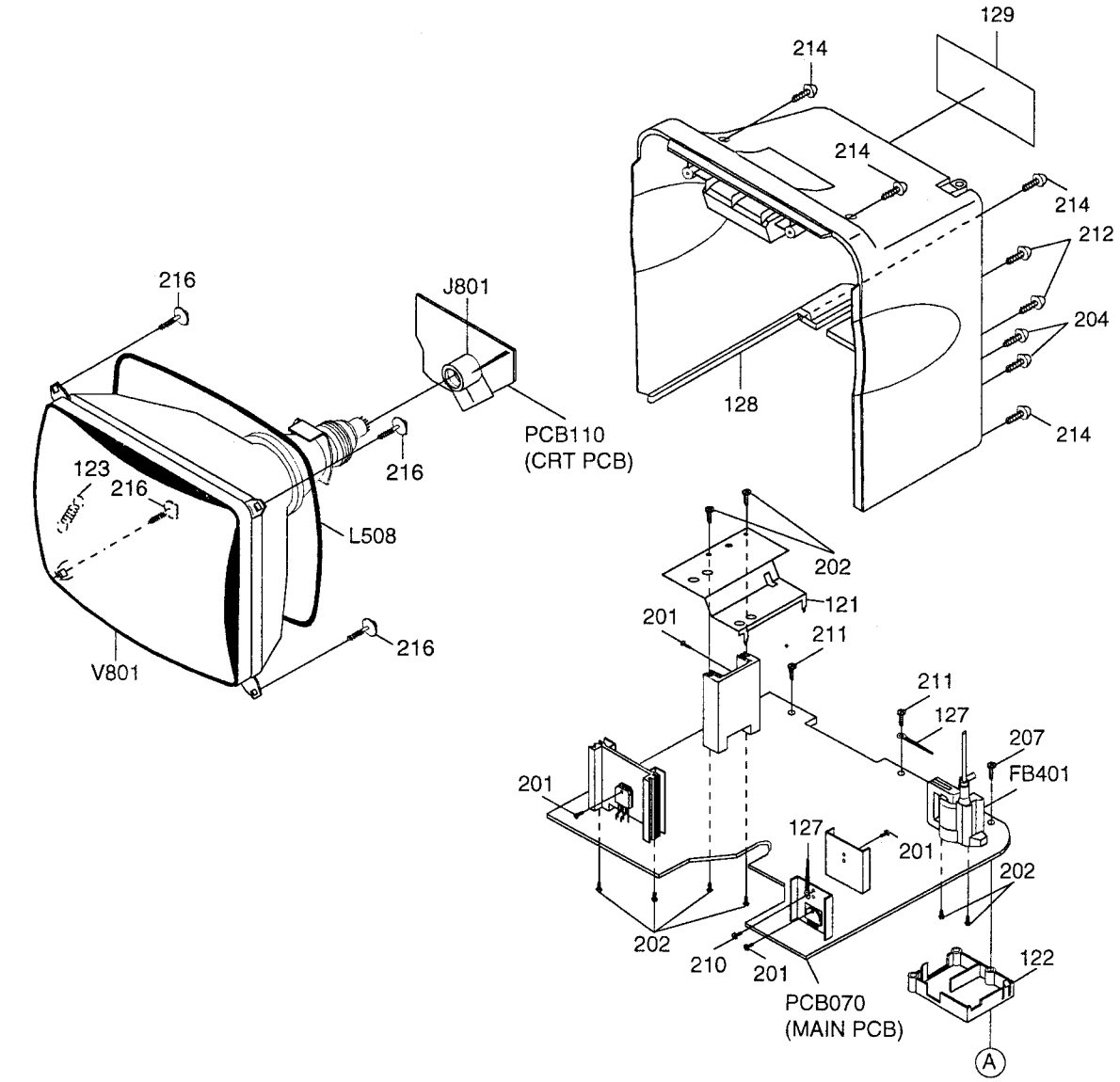
T' TEXT

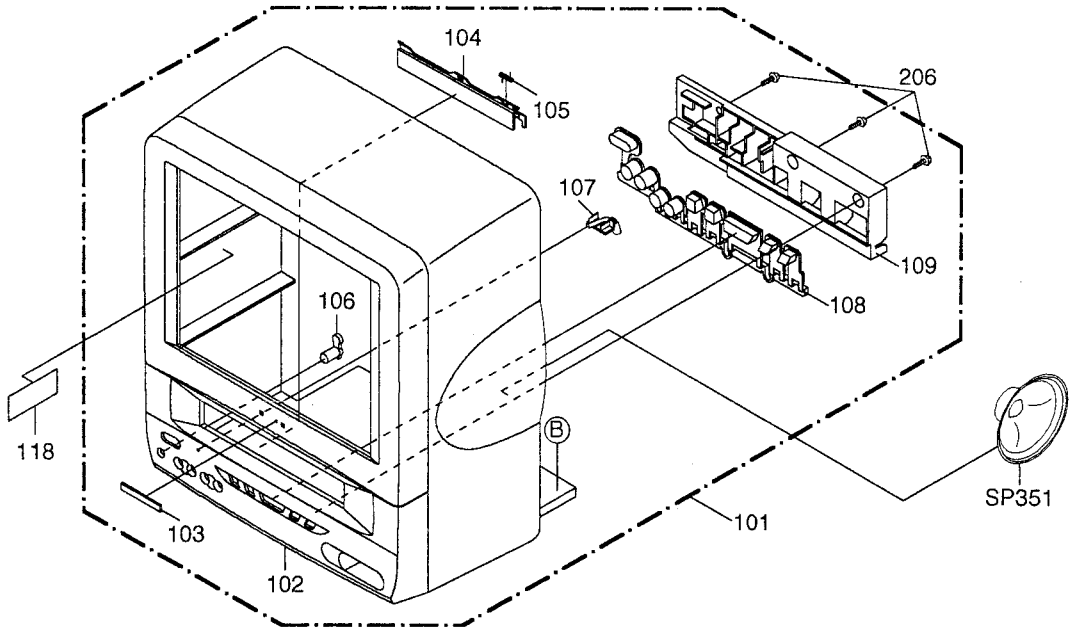


(47) POWER ON
200mV 50ns/div

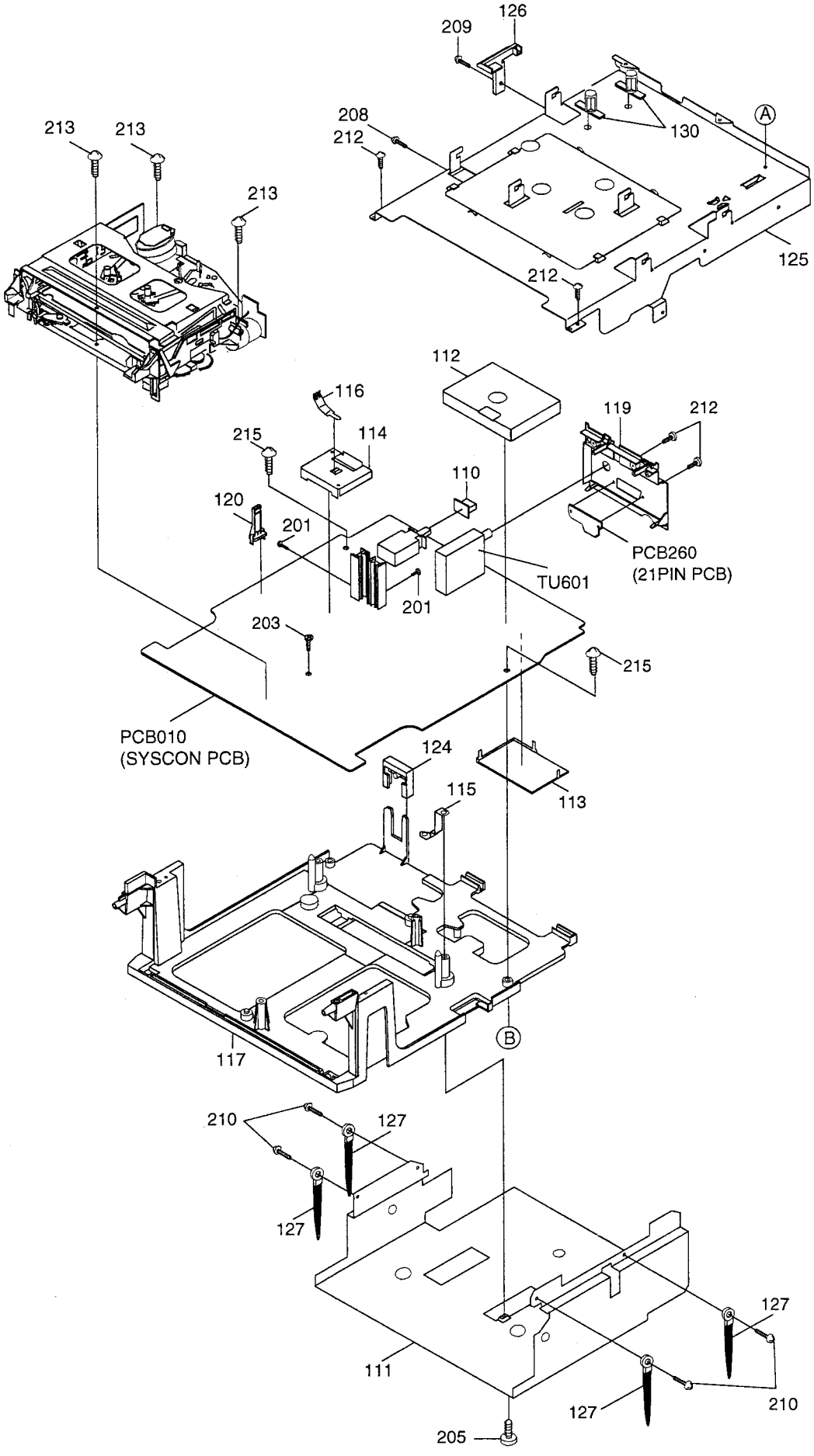
NOTE: The following waveforms were measured at the point of the corresponding balloon number in the schematic diagram.

MECHANICAL EXPLODED VIEW

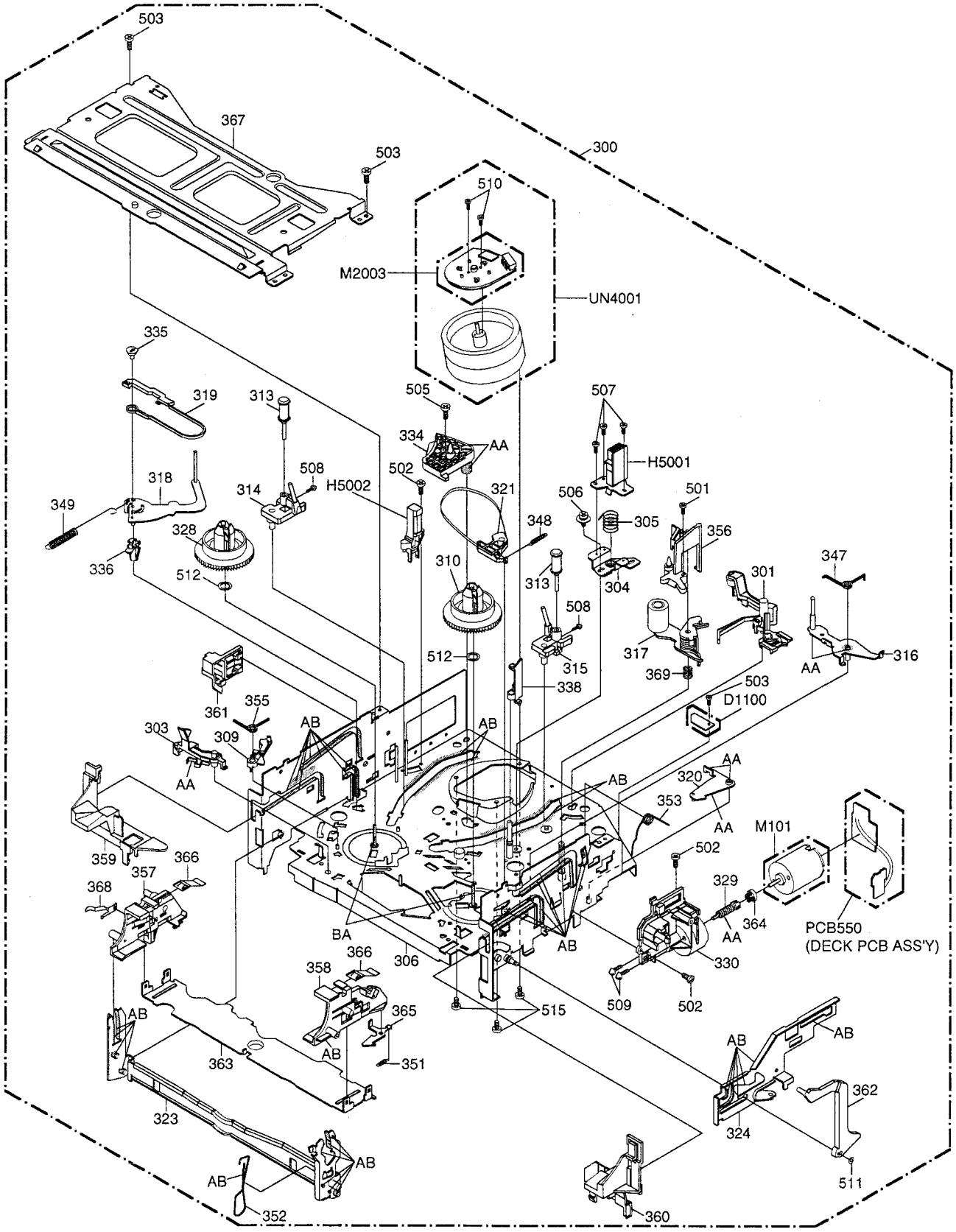




MECHANICAL EXPLODED VIEW



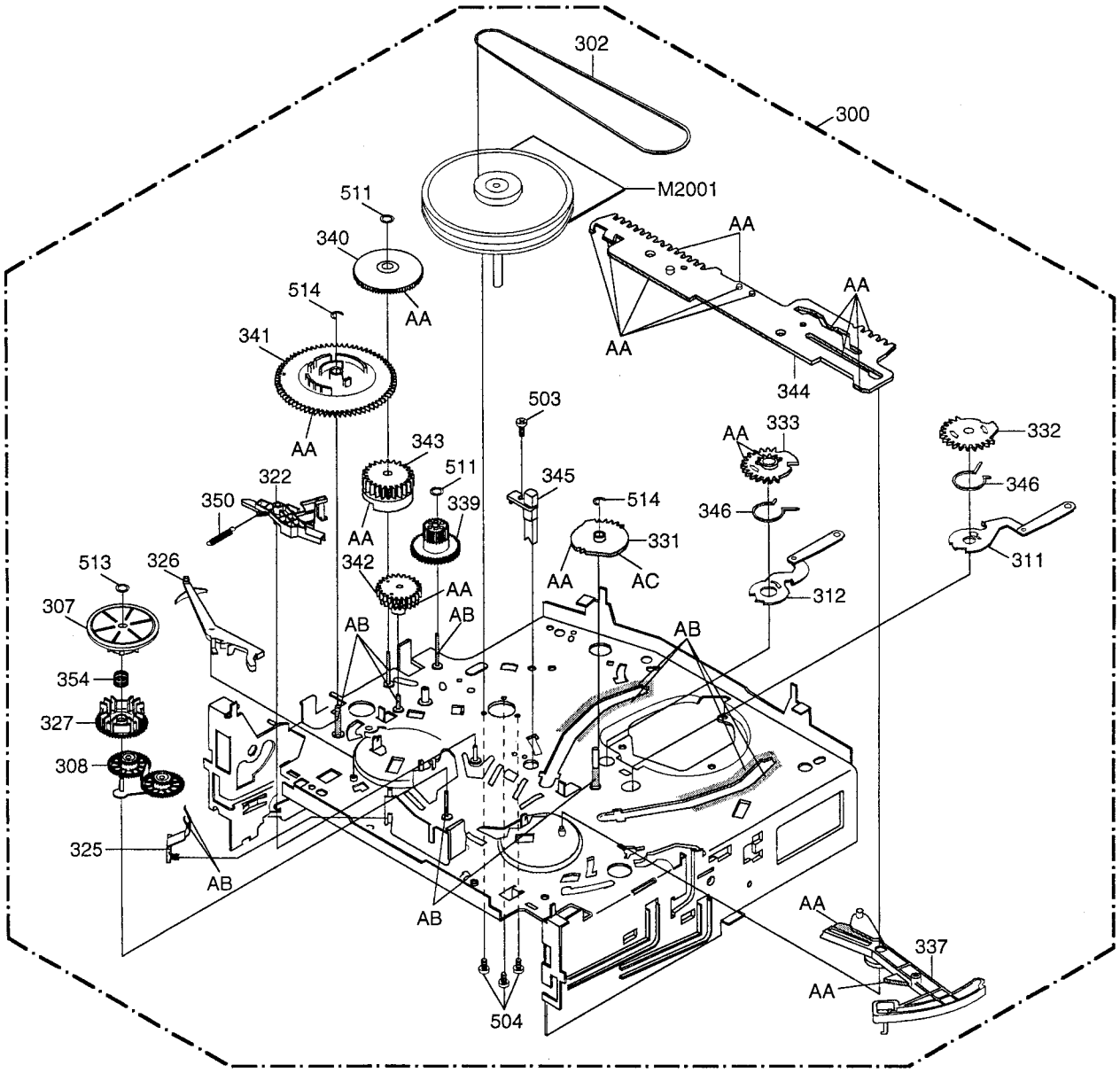
CHASSIS EXPLODED VIEW (TOP VIEW)



CLASS	PART NO.	MARK
GREASE	G-555G	AA
	MG-33	AB
	FL-721	AC
OIL	FL OIL No. 6115	BA

NOTE: Applying positions AA, AB, AC and BA for the grease or oil are displayed for this section. Check if the correct grease or oil is applied for each position.

CHASSIS EXPLODED VIEW (BOTTOM VIEW)



CLASS	PART NO.	MARK
GREASE	G-555G	AA
	MG-33	AB
	FL-721	AC
OIL	FL OIL No. 6115	BA

NOTE: Applying positions AA, AB, AC and BA for the grease or oil are displayed for this section. Check if the correct grease or oil is applied for each position.

MECHANICAL REPLACEMENT PARTS LIST

REF. NO.	PART NO.	DESCRIPTION		
101	A59715B720	CABINET,FRONT ASS'Y		
102	701WPJB704	CABINET,FRONT		
103	711WPCA016	BADGE,BRAND		
104	712WPJB420	FLAT,FLAP		
105	743WKA0032	SPRING,FLAP(COMBO)		
106	713WPA0136	GUIDE,REMOCON		
107	713WPA0135	GLASS,LED		
108	735WPBA404	BUTTON,FRAME		
109	738WPAA010	BUTTON,BASE		
110	735WPA0288	BUTTON,POWER		
111	752WSA0250	PLATE,SHIELD BOTTOM		
112	752WSAA036	SHIELD,CASE		
113	752WSAA037	SHIELD,COVER		
114	752WSA0209	SHIELD,CASE HEAD AMP		
115	753WSA0120	PLATE,BOTTOM-EARTH		
116	753WUAA006	SPRING,EARTH HEAD AMP		
117	761WPAA047	HOLDER,DECK		
118	722000A063	SHEET,PTB		
119	771WPAA043	PLATE,JACK		
120	85OP700036	HOLDER EOT SENSOR		
121	753WSA0133	SHIELD,TV MAIN PCB		
122	761WPA0223	HOLDER,FBT		
123	741WUA0002	SPRING,EARTH		
124	761WPAA049	HOLDER,BUSH		
125	752WSA0210	PLATE,DECK SHIELD		
126	761WPA0151	HOLDER,M/PCB		
127	8995034000	CORD CLIP UL CO.		
128	702WPAA160	CABINET,BACK		
129	722202A612	SHEET,RATING		
130	890PS70100	PUSH SPACER		
201	8109I30A04	SCREW,TAP TITE(B)	WH7	3x10
202	8109630802	SCREW,TAP TITE(B)	BRAZIER	3x8
203	8110330804	SCREW,TAP TITE(P)	FLAT	3x8
204	8110630A24	SCREW,TAP TITE(P)	BRAZIER	3x12
205	8110630604	SCREW,TAP TITE(P)	BRAZIER	3x6
206	8110630804	SCREW,TAP TITE(P)	BRAZIER	3x8
207	810A130B04	SCREW/WASHER(A)		M3x20
208	8107226604	SCREW,TAP TITE(S)	BIND	2.6x6
209	8107230804	SCREW,TAP TITE(S)	BIND	3x8
210	8107630604	SCREW,TAP TITE(S)	BRAZIER	3x6
211	8107930604	SCREW,CUP(S)		3x6
212	8110630A04	SCREW,TAP TITE(P)	BRAZIER	3x10
213	8117140A24	SCREW,TAPPING(B0)	PAN	4x12
214	8117540A64	SCREW,TAPPING(B0)	TRUSS	4x16
215	8117540B04	SCREW,TAPPING(B0)	TRUSS	4x20
216	8141J40B84	SCREW,TAP TITE(P)	GW15	4x28
---	791WHA0023	LAMIFILM BAG		
---	792WHA0299	PACKAGE,TOP		
---	792WHA0300	PACKAGE,BOTTOM		
---	793WCDB274	GIFT BOX		
---	JB5K0200	POLYBAG,INSTRUCTION		
---	J5971501	INSTRUCTION BOOK		
---	J5971507	QUICK SET-UP SHEET		
---	A59715B975	INSTRUCTION BOOK KIT		

CHASSIS REPLACEMENT PARTS LIST

REF. NO.	PART NO.	DESCRIPTION	REF. NO.	PART NO.	DESCRIPTION	
300	A547A6B420A	DECK ASSY A547A6B420A	501	8107126A04	SCREW,TAP TITE(S) PAN	2.6x10
			502	8107226804	SCREW,TAP TITE(S) BIND	2.6x8
301	85OA500022	AHC ASS'Y	503	8107226604	SCREW,TAP TITE(S) BIND	2.6x6
302	85OP200290	BELT,CAPSTAN (S)	504	8109126604	SCREW,TAP TITE(B) PAN	2.6x6
303	85OP900710	LEVER,REC	505	810A126804	SCREW/WASHER(A)	M2.6x8
304	85OP500083	BASE,AC HEAD	506	810B126404	SCREW/WASHER(B)	M2.6x4
305	85OP800324	SPRING,AC HEAD	507	8102120604	SCREW,PAN	M2x6
306	85OA000367	MAIN CHASSIS ASS'Y (S-Z)	508	8102120304	SCREW,PAN	M2x3
307	85OA200082	CLUTCH ASS'Y(S2)	509	8102130304	SCREW,PAN	M3.0x3.0
308	85OA200080	ARM IDLER ASS'Y (S)				
309	85OP600556	ARM,SS BRAKE (S)	510	810A123504	SEMS A	M2.3x5.0
			511	82P266005N	POLYSLIDER WASHER(CUT)	2.6x6.0xT0.5
310	85OP200292	REEL,T (S)	512	82Q2647C5N	POLYSLIDER WASHER	2.6x4.7xT0.25
311	85OA300061	LOADING ARM S ASS'Y	513	82P184505N	POLYSLIDER WASHER(CUT)	1.8x4.5xT0.5
312	85OA300062	LOADING ARM T ASS'Y	514	83ETW30000	E-RING	3
313	85OA400214	GUIDE ROLLER ASS'Y 1.3	515	810A126504	SCREW/WASHER(A)	M2.6x5
314	85OA400188	BASE,INCL S ASS'Y				
315	85OA400196	BASE,INCL T(S) ASS'Y	CP101	069R740018	CONNECTOR PCB SIDE	52044-0445
316	85OA400199	P5-3 ARM ASS'Y(S)	D1100	DAK0000170	DEW SENSORCW/AL,PLATE	HDP-05-26
317	85OA400205	PINCH ROLLER BLOCK	H5001	1523D91034	HEAD (AUDIO CONTROL)	HVMXA1072A
318	85OA400175	TENSION ARM ASS'Y	H5002	1543D02013	HEAD (FULL ERASE)	HVFHP0032A
319	85OA400184	TENSION BAND ASS'Y (S)	⚠ M101	1596P78001	MOTOR (LOADING)	MXN13FB11H
			⚠ M2001	1594J98009	CAPSTAN DD UNIT	EP15BD
320	85OA400178	PINCH ROLLER LEVER ASS'Y	M2003	1589V11007	MICRO MOTOR	EP14BD
321	85OA600196	BRAKE T ASSY(S)	PCB550	A545C9P550	DECK PCB ASS'Y	VE8851
322	85OA600191	CAP BRAKE ASS'Y(S)	Q101	0000700320	TRANSISTOR,PHOTO	RPT-38PB113
323	85OA900213	LINK ASS'Y	⚠ UN4001	A4C606A500	CYLINDER UNIT ASSY	A4C606A500
324	85OA900216	LINK LEVER ASS'Y				
325	85OP200284	LEVER,CLUTCH (S)				
326	85OP200285	ACTUATOR,CLUTCH				
327	85OP200298	GEAR,COUPLING(S2)				
328	85OP200291	REEL,S (S)				
329	85OP600541	WORM				
330	85OP600563	BRACKET MOTOR				
331	85OP300193	GEAR,MAIN LOADING				
332	85OP300179	GEAR,LOADING S				
333	85OP300180	GEAR,LOADING T				
334	85OP300187	HOLDER,LOADING GEAR (S-Z)				
335	85OP400472	ADJUST,TENSION				
336	85OP400492	HOLDER,TENSION				
337	85OP400490	LEVER,TENSION				
338	85OP400475	COVER,P4				
339	85OP600543	GEAR,JOINT				
340	85OP600544	GEAR,MIDDLE				
341	85OP600554	CAM,MAIN (S)				
342	85OP600546	CAM P5				
343	85OP600565	CAM,PINCH ROLLER				
344	85OP600561	ROD,MAIN(S)				
345	85OP700035	REFLECTOR,LED				
346	85OP800318	SPRING LOADING GEAR				
347	85OP800334	SPRING,P5 (S)				
348	85OP800335	SPRING,BRAKE T (S)				
349	85OP800322	SPRING,TENSION				
350	85OP800336	SPRING,CAP BRAKE (S)				
351	85OP800342	SPRING,LOCKER (S)				
352	85OP800326	SPRING,LINK				
353	85OP800328	SPRING,DAMPER				
354	85OP800330	SPRING,RING				
355	85OP800337	SPRING,SS BRAKE (S)				
356	85OP900680	OPENER,CASS				
357	85OP900731	CASS SIDE L(VA)				
358	85OP900732	CASS SIDE R				
359	85OP900728	TAPE GUIDE L(P,R)				
360	85OP900729	TAPE GUIDE R				
361	85OP900714	COVER SENSOR L3				
362	85OP900688	LEVER,FLAP				
363	85OP900690	CASS HOLDER				
364	85OP600540	DRIVER,WORM				
365	85OP900713	LOCKER,R2				
366	85OP900694	SPRING,PACK				
367	85OP900695	BRACKET,TOP				
368	85OP900696	SPRING,CASS EARTH				
369	85OP800341	SPRING,P/R ARM				

ELECTRICAL REPLACEMENT PARTS LIST

REF. NO.	PART NO.	DESCRIPTION	
		RESISTORS	
⚠ R447	R65582680J	R,FUSE	68 OHM 1/2W
⚠ R449	R5X2CE682J	R,CEMENT	6.8K OHM 7W
⚠ R450	R6558A100J	R,FUSE	10 OHM 2W
R501	R5X2CD2R2J	R,CEMENT	2.2 OHM 5W
⚠ R505	R3X28B473J	R,METAL OXIDE	47K OHM 3W
⚠ R511	R3X181R33J	R,METAL OXIDE	0.33 OHM 1W
⚠ R517	R002T4102J	RC	1K OHM 1/4W
⚠ R529	R002T4272J	RC	2.7K OHM 1/4W
R545	R3X181563J	R,METAL OXIDE	56K OHM 1W
R547	R3X28B100J	R,METAL OXIDE	10 OHM 3W
⚠ R802	R3X181153J	R,METAL OXIDE	15K OHM 1W
⚠ R805	R3X181153J	R,METAL OXIDE	15K OHM 1W
⚠ R810	R3X181153J	R,METAL OXIDE	15K OHM 1W
⚠ R1005	R615J12R7J	R,FUSE	2.7 OHM 1W
		CAPACITORS	
C402	E5EZFC220M	CE	22 UF 200V
C407	E02L03102M	CE	1000 UF 25V
C414	P21503475K	CMP	4.7 UF 250V ECQ-E
C423	P447F2274J	CMPP	0.27 UF 200V FHS
⚠ C424	P414F9682H	CMPP	0.0068UF 1.6KV ECWH
C425	C03L0R7W2K	CC	820 PF 2KV R
C430	C03L0R713K	CC	0.001 UF 2KV R
C502	C13HB07H3K	CC	0.0022UF 2KV B or
	C0HHB07H3K	CC	0.0022UF 2KV B
C503	C13HB07H3K	CC	0.0022UF 2KV B or
	C0HHB07H3K	CC	0.0022UF 2KV B
C505	P2122B224M	CMP	0.22 UF 250V ECQUL
⚠ C507	E52C0H101M	CE	100 UF 400V
⚠ C510	E5EZT3470M	CE	47 UF 25V or
	E5EZT4470M	CE	47 UF 35V
C514	C03L0R7S2K	CC	560 PF 2KV R
C515	E62FF3152M	CE	1500 UF 25V
C518	C03L0R7B3K	CC	0.0012UF 2KV R
C519	CB3930MH3M	CC	0.0022UF 250V
C520	CB3930MH3M	CC	0.0022UF 250V
C521	P2122B224M	CMP	0.22 UF 250V ECQUL
C523	CB3930M13M	CC	0.001 UF 250V
C525	C03L0R7W2K	CC	820 PF 2KV R
C528	E5EZFB101M	CE	100 UF 160V
C534	E5EZFB101M	CE	100 UF 160V
C540	E5EZFB101M	CE	100 UF 160V
C551	E62FF3152M	CE	1500 UF 25V
C801	C03L0R713K	CC	0.001 UF 2KV R
C1003	E51XWP104Z	CE	0.1 F 5.5V
		DIODES	
D401	D2WT011E10	DIODE SILICON	11E1-EIC
D402	D2LTPG06J0	DIODE SILICON	RMPG06J-G3 or
	D28T10ELS6	DIODE,RECTIFIER	10ELS6TA1B2
D403	D97U05R61B	DIODE,ZENER	MTZJ5.6B T-77
D411	D2LTPG06J0	DIODE SILICON	RMPG06J-G3 or
	D28T10ELS6	DIODE,RECTIFIER	10ELS6TA1B2
D413	D2LTPG06J0	DIODE SILICON	RMPG06J-G3 or
	D28T10ELS6	DIODE,RECTIFIER	10ELS6TA1B2
D501	D97U01001B	DIODE,ZENER	MTZJ10B T-77
D502	D1VT001330	DIODE,SILICON	1SS133T-77
⚠ D503	D2WTRM11C0	DIODE SILICON	RM11C-EIC
⚠ D504	D2WTRM11C0	DIODE SILICON	RM11C-EIC
D505	D94TA27011	DIODE ZENER	HZ27-1L TD
D506	D2LTPG06J0	DIODE SILICON	RMPG06J-G3 or
	D28T10ELS6	DIODE,RECTIFIER	10ELS6TA1B2
D508	D2B0EG01Z0	DIODE SILICON	EG01Z or
	D2BT0EG01Z	DIODE,SILICON	EG01Z-V0
D509	D2BTRU2AM0	DIODE SILICON	RU2AM V1
D510	D2BTRU2AM0	DIODE SILICON	RU2AM V1
D512	D1VT001330	DIODE,SILICON	1SS133T-77
D513	D28T011ES1	DIODE,SILICON	11ES1TA1
D515	D97U03001B	DIODE,ZENER	MTZJ30B T-77 or
	D97X03001B	DIODE,ZENER	MTZJ-30B-T72
D516	D1VT001330	DIODE,SILICON	1SS133T-77
D517	D1VT001330	DIODE,SILICON	1SS133T-77
D518	D2LTPG06J0	DIODE SILICON	RMPG06J-G3 or
	D28T10ELS6	DIODE,RECTIFIER	10ELS6TA1B2
D519	D1VT001330	DIODE,SILICON	1SS133T-77
D520	D1VT001330	DIODE,SILICON	1SS133T-77
D521	D2BT0EG01Z	DIODE,SILICON	EG01Z-V0
D522	D97U01601B	DIODE ZENER	MTZJ16B T-77
D523	D1VT001330	DIODE,SILICON	1SS133T-77

REF. NO.	PART NO.	DESCRIPTION	
		DIODES	
D524	D1VT001330	DIODE,SILICON	1SS133T-77
D527	D1VT001330	DIODE,SILICON	1SS133T-77
D528	D97U05R61B	DIODE,ZENER	MTZJ5.6B T-77
D529	D1VT001330	DIODE,SILICON	1SS133T-77
D530	D1VT001330	DIODE,SILICON	1SS133T-77
D531	D28T21DQN9	DIODE SCHOTTKY	21DQ09N-TA2B1
D532	D2B0RU2AM0	DIODE SILICON	RU2AM or
	D2BTRU2AM0	DIODE SILICON	RU2AM V1
D534	D1VT001330	DIODE,SILICON	1SS133T-77
⚠ D535	D2WTRM11C0	DIODE SILICON	RM11C-EIC
⚠ D536	D2WTRM11C0	DIODE SILICON	RM11C-EIC
D537	D28TELS2N2	DIODE RECTIFIER	10ELS2N-TA1B2
D538	D2B0RU2AM0	DIODE SILICON	RU2AM or
	D2BTRU2AM0	DIODE SILICON	RU2AM V1
D539	D2WT11ES10	DIODE SILICON	11ES1-EIC
D540	D1VT001330	DIODE,SILICON	1SS133T-77
D541	D1VT001330	DIODE,SILICON	1SS133T-77
D542	D28TELS2N2	DIODE RECTIFIER	10ELS2N-TA1B2
D543	D28T21DQN9	DIODE SCHOTTKY	21DQ09N-TA2B1
D544	D28T21DQN9	DIODE SCHOTTKY	21DQ09N-TA2B1
D545	D28T21DQN9	DIODE SCHOTTKY	21DQ09N-TA2B1
D546	D1VT001330	DIODE,SILICON	1SS133T-77
D547	D1VT001330	DIODE,SILICON	1SS133T-77
D548	D1VT001330	DIODE,SILICON	1SS133T-77
D550	D97U05R61B	DIODE,ZENER	MTZJ5.6B T-77
D551	D97U02R21B	DIODE,ZENER	MTZJ2.2B T-77
D553	D2B0RU2AM0	DIODE SILICON	RU2AM or
	D2BTRU2AM0	DIODE SILICON	RU2AM V1
D601	D1VT001330	DIODE,SILICON	1SS133T-77
D604	D28T11ESN1	DIODE SILICON	11ES1N-TA1B2
D605	D1VT001330	DIODE,SILICON	1SS133T-77
D851	D1VT001330	DIODE,SILICON	1SS133T-77
D852	D1VT001330	DIODE,SILICON	1SS133T-77
D854	D23U1003A3	DIODE,SCHOTTKY	SB10-03A3
D855	D1VT001330	DIODE,SILICON	1SS133T-77
D856	D1VT001330	DIODE,SILICON	1SS133T-77
D857	D1VT001330	DIODE,SILICON	1SS133T-77
D858	D1VT001330	DIODE,SILICON	1SS133T-77
D859	D1VT001330	DIODE,SILICON	1SS133T-77
D860	D1VT001330	DIODE,SILICON	1SS133T-77
D861	D1VT001330	DIODE,SILICON	1SS133T-77
D863	D28TQS04N0	DIODE SCHOTTKY	11EQS04N-TA1B2
D1001	D2LXE65800	DIODE SILICON	1N4005E-6580-G23
D1002	D1VT001330	DIODE,SILICON	1SS133T-77
D1003	0010C00090	INFRARED LED	TSAL7200ASZ
D1004	D2LXE65800	DIODE SILICON	1N4005E-6580-G23
D1005	D92T1120B0	DIODE ZENER	RD12FB-T7
D1006	D23U1003A3	DIODE,SCHOTTKY	SB10-03A3
D1007	D1VT001330	DIODE,SILICON	1SS133T-77
D1008	D97U05R61B	DIODE,ZENER	MTZJ5.6B T-77
D1010	D23U1003A3	DIODE,SCHOTTKY	SB10-03A3
D1011	D1VT001330	DIODE,SILICON	1SS133T-77
D1012	D1VT001330	DIODE,SILICON	1SS133T-77
D1014	D1VT001330	DIODE,SILICON	1SS133T-77
D1015	D1VT001330	DIODE,SILICON	1SS133T-77
D1016	D1VT001330	DIODE,SILICON	1SS133T-77
D1017	D1VT001330	DIODE,SILICON	1SS133T-77
D1018	D28TQS04N0	DIODE SCHOTTKY	11EQS04N-TA1B2
D1019	D28TQS04N0	DIODE SCHOTTKY	11EQS04N-TA1B2
D1021	D97U05R61B	DIODE,ZENER	MTZJ5.6B T-77
D1023	D1VT001330	DIODE,SILICON	1SS133T-77
D4003	D1VTB721Q0	DIODE SCHOTTKY	RB721Q-40 T-77
D4202	D28T11ESN1	DIODE SILICON	11ES1N-TA1B2
D4203	0021721150	LED	SLR-342VCT32
D4204	0021721150	LED	SLR-342VCT32
D4205	0021721150	LED	SLR-342VCT32
D4501	D1VT001330	DIODE,SILICON	1SS133T-77
D4503	D1VT001330	DIODE,SILICON	1SS133T-77
D4505	D1VT001330	DIODE,SILICON	1SS133T-77
D4510	D1VT001330	DIODE,SILICON	1SS133T-77
D4511	D1VT001330	DIODE,SILICON	1SS133T-77
D4512	D17X001330	DIODE,SILICON	1SS133T-72
		ICS	
⚠ IC351	I01DP75110	IC	AN7511
⚠ IC401	I03TD80400	IC	LA78040
⚠ IC501	I2BT066510	IC	STR-G6651
⚠ IC504	IDJD076100	IC	FA7610CP

ELECTRICAL REPLACEMENT PARTS LIST

REF. NO.	PART NO.	DESCRIPTION		
		ICS		
IC506	0002500560	PHOTO COUPLER	TLP621(D4-GR-LF2)	
IC601	I03DE68120	IC	LA76812	
IC851	ICKD001060	IC	ET106	or
	ICKD002060	IC	ET206	
IC852	ICKD003170	IC	ET317	
IC853	I55JM4053A	IC	TC74HC4053AF	
⚠ IC1001	I07SQ69550	IC	BA6955N	
IC1002	IE1J0S31AH	IC	RE5VS31A	
IC1003	I1KA97809A	IC	KIA7809API	
IC1004	I1KA97805A	IC	KIA7805API	
IC1005	I1KA97805A	IC	KIA7805API	
IC1006	I54F50094B	IC	OEC0094B	
IC1099	A547B0B015	IC	S-24C08ADPA-01	
IC4001	I04F38217F	IC	HA118217F	
		TRANSISTORS		
Q401	TPYTB03001	COMPOUND TRANSISTOR	DTA114ESTP	
Q402	TF2002P4M0	THYRISTOR	2P4M	
Q405	TC3T022710	TRANSISTOR,SILICON	2SC2271(D,E)-AE	
⚠ Q406	TD30026270	TRANSISTOR SILICON	2SD2627LS-CBC11	
Q471	TC3T029090	TRANSISTOR,SILICON	2SC2909(S,T)-AA	
Q472	TA3T1371A0	TRANSISTOR,SILICON	2SA1371(D,E)-AE	
⚠ Q501	TC5T018154	TRANSISTOR,SILICON	2SC1815Y(TPE2)	
⚠ Q503	TPYTB03001	COMPOUND TRANSISTOR	DTA114ESTP	
⚠ Q505	T410029030	FET	2SK2903-01MR	
Q506	TNYTJ03001	COMPOUND TRANSISTOR	DTC114TSTP	
Q507	TC5T018154	TRANSISTOR,SILICON	2SC1815Y(TPE2)	
Q509	TC5T018154	TRANSISTOR,SILICON	2SC1815Y(TPE2)	
Q510	TNYTB03001	COMPOUND TRANSISTOR	DTC114ESTP	or
	TNATB03005	COMPOUND TRANSISTOR	KRC102MAT	
Q511	TC5T018154	TRANSISTOR,SILICON	2SC1815Y(TPE2)	
Q512	TAST009520	TRANSISTOR,SILICON	2SA952(C)-T(L,M)	
Q513	TNYTB03001	COMPOUND TRANSISTOR	DTC114ESTP	or
	TNATB03005	COMPOUND TRANSISTOR	KRC102MAT	
Q514	TNYTB03001	COMPOUND TRANSISTOR	DTC114ESTP	or
	TNATB03005	COMPOUND TRANSISTOR	KRC102MAT	
Q518	TNYTB03001	COMPOUND TRANSISTOR	DTC114ESTP	or
	TNATB03005	COMPOUND TRANSISTOR	KRC102MAT	
Q601	TC3T030000	TRANSISTOR,SILICON	2SC3000-AA	
Q602	T8YJ2412K0	TRANSISTOR SILICON	2SC2412KT146 R,S	
Q603	TNYJB05001	COMPOUND TRANSISTOR	DTC114EKAT146	
Q604	TNYJB05001	COMPOUND TRANSISTOR	DTC114EKAT146	
Q605	T8YJ2412K0	TRANSISTOR SILICON	2SC2412KT146 R,S	
Q608	TAYT0933S0	TRANSISTOR,SILICON	2SA933STP(R,S)	
Q609	T8YJ2412K0	TRANSISTOR SILICON	2SC2412KT146 R,S	
Q610	T8YJ2412K0	TRANSISTOR SILICON	2SC2412KT146 R,S	
Q804	TCYT034150	TRANSISTOR,SILICON	2SC3415T93-(N,P)	
Q805	TCYT034150	TRANSISTOR,SILICON	2SC3415T93-(N,P)	
Q806	TCYT034150	TRANSISTOR,SILICON	2SC3415T93-(N,P)	
Q851	T8YJ2412K0	TRANSISTOR SILICON	2SC2412KT146 R,S	
Q852	T8YJ2412K0	TRANSISTOR SILICON	2SC2412KT146 R,S	
Q853	T8YJ2412K0	TRANSISTOR SILICON	2SC2412KT146 R,S	
Q855	T8YJ2412K0	TRANSISTOR SILICON	2SC2412KT146 R,S	
Q856	T8YJ2412K0	TRANSISTOR SILICON	2SC2412KT146 R,S	
Q862	T8YJ2412K0	TRANSISTOR SILICON	2SC2412KT146 R,S	
Q863	T8YJ2412K0	TRANSISTOR SILICON	2SC2412KT146 R,S	
Q1001	0002700690	PHOTO COUPLER	RPI-303	or
	0002700590	PHOTO COUPLER	RPI-301	
Q1002	T8YJ2412K0	TRANSISTOR SILICON	2SC2412KT146 R,S	
Q1003	0002M00610	PHOTO COUPLER	SG-276	
Q1004	TNYJC05001	COMPOUND TRANSISTOR	DTC124EKAT146	
Q1005	0002700690	PHOTO COUPLER	RPI-303	or
	0002700590	PHOTO COUPLER	RPI-301	
Q1006	TPYJC05001	COMPOUND TRANSISTOR	DTA124EKAT146	
Q1007	TNYJJ05001	COMPOUND TRANSISTOR	DTC114TKAT146	
Q1008	TNYJJ05001	COMPOUND TRANSISTOR	DTC114TKAT146	
Q1009	0002M00610	PHOTO COUPLER	SG-276	
Q1010	TD3T007340	TRANSISTOR,SILICON	2SD734(E,F)-AA	or
	TCAT032034	TRANSISTOR, SILICON	KTC3203_Y-AT	
Q1012	TNYJJ05001	COMPOUND TRANSISTOR	DTC114TKAT146	
Q1013	TB3T008920	TRANSISTOR,SILICON	2SB892(S,T)-AE	
Q1014	T8YJ2412K0	TRANSISTOR SILICON	2SC2412KT146 R,S	
Q1015	T8YJ2412K0	TRANSISTOR SILICON	2SC2412KT146 R,S	
Q1016	T8YJ2412K0	TRANSISTOR SILICON	2SC2412KT146 R,S	
Q1017	0000100380	PHOTO TRANSISTOR	PNA2604M010R	
Q1018	TB3T008920	TRANSISTOR,SILICON	2SB892(S,T)-AE	
Q1019	TB3T008920	TRANSISTOR,SILICON	2SB892(S,T)-AE	
Q1020	TNYJA05001	COMPOUND TRANSISTOR	DTC143EKAT146	

REF. NO.	PART NO.	DESCRIPTION		
		TRANSISTORS		
Q1021	T8YJ2412K0	TRANSISTOR SILICON	2SC2412KT146 R,S	
Q4001	TD3T007340	TRANSISTOR,SILICON	2SD734(E,F)-AA	or
	TCAT032034	TRANSISTOR, SILICON	KTC3203_Y-AT	
Q4002	TD3T007340	TRANSISTOR,SILICON	2SD734(E,F)-AA	or
	TCAT032034	TRANSISTOR, SILICON	KTC3203_Y-AT	
Q4003	TPYJC05001	COMPOUND TRANSISTOR	DTA124EKAT146	
Q4004	TCWT022740	TRANSISTOR,SILICON	2SC2274(E,F)-AA	or
	TCATC0200Y	TRANSISTOR SILICON	KTC200_Y-AT	
Q4005	TCWT022740	TRANSISTOR,SILICON	2SC2274(E,F)-AA	or
	TCATC0200Y	TRANSISTOR SILICON	KTC200_Y-AT	
Q4006	T6YJ1037K0	TRANSISTOR,SILICON	2SA1037AKT146R,S	
Q4007	T8YJ2412K0	TRANSISTOR SILICON	2SC2412KT146 R,S	
Q4010	T8YJ2412K0	TRANSISTOR SILICON	2SC2412KT146 R,S	
Q4201	TNYTB05001	COMPOUND TRANSISTOR	DTC114EKT147	
Q4501	T8YJ2412K0	TRANSISTOR SILICON	2SC2412KT146 R,S	
Q4502	T6YJ1037K0	TRANSISTOR,SILICON	2SA1037AKT146R,S	
Q4505	T8YJ2412K0	TRANSISTOR SILICON	2SC2412KT146 R,S	
Q4507	T8YJ2412K0	TRANSISTOR SILICON	2SC2412KT146 R,S	
Q4509	T8YJ2412K0	TRANSISTOR SILICON	2SC2412KT146 R,S	
Q4510	T8YJ2412K0	TRANSISTOR SILICON	2SC2412KT146 R,S	
Q4511	T8YJ2412K0	TRANSISTOR SILICON	2SC2412KT146 R,S	
Q4512	T8YJ2412K0	TRANSISTOR SILICON	2SC2412KT146 R,S	
		COILS &TRANSFORMERS		
L401	021679472K	COIL	4.7 MH	
L501	029X000052	COIL,LINE FILTER	SS28V-08350	
L503	021767100K	COIL	10 UH	
L508	028R090008	COIL,DEGAUSS	8R090008	
L552	02A6A8A0A1	CORE,FERRITE	HF57T18.5*10*10	
L600	02A1281872	CORE,TRIDAL	KR16TT281807D	
L601	02167D101K	COIL	100 UH	
L603	021LA6150K	COIL	15 UH	
L604	021LA6R27M	COIL	0.27 UH	or
	021JA6R27M	COIL	0.27 UH	
L605	02167D101K	COIL	100 UH	
L606	021LA62R2K	COIL	2.2 UH	
L608	0336000428	COIL,VIDEO IFT	3600042	
L609	02167D101K	COIL	100 UH	
L654	02A6A8A0A1	CORE,FERRITE	HF57T18.5*10*10	
L801	021673101K	COIL	100 UH	
L810	02A6A8A0A1	CORE,FERRITE	HF57T18.5*10*10	
L851	021673100K	COIL	10 UH	
L852	021673100K	COIL	10 UH	
L854	021673101K	COIL	100 UH	or
	021673101J	COIL	100 UH	
L1001	021LA6120K	COIL	12 UH	
L4001	0326230038	COIL,TRAP	2623003	or
	032623004T	COIL TRAP	STP-01064	
L4002	02167D101K	COIL	100 UH	
L4003	02167D101K	COIL	100 UH	
L4004	02167F101J	COIL	100 UH	
L4005	0316260088	COIL,BIAS OSC	1626008	
L4006	02167D102K	COIL	1 MH	
L4008	021673102K	COIL	1 MH	
L4009	02167D101K	COIL	100 UH	
L4011	021LA6120K	COIL	12 UH	
L4012	021LA6221K	COIL	220 UH	
L4013	02167D101K	COIL	100 UH	
L4015	02167D101K	COIL	100 UH	
L4016	021LA6390K	COIL	39 UH	
L4020	021LA6100K	COIL	10 UH	
L4021	021LA6100K	COIL	10 UH	
L4022	021LA6100K	COIL	10 UH	
L4201	021LA6100K	COIL	10 UH	
L4501	021673101K	COIL	100 UH	or
	021673101J	COIL	100 UH	
L4503	021LA6100K	COIL	10 UH	
L4504	021LA6100K	COIL	10 UH	
T401	03305Y0018	TRANS,HORIZONTAL DRIVE	305Y001	
⚠ T501	0481290634	TRANSFORMER,SWITCHING	81290634	
T502	0481290644	TRANSFORMER,SWITCHING	81290644	
		JACKS		
J351	0602131011	HEADPHONE JACK	HSJ2000-01-010	
J503	0602602006	JACK DC	HEC0824-010010	
⚠ J801	066X120014	SOCKET,CATHODE RAY TUBE	HPS3200-010501	
J1001	060G421016	RCA JACK	HTJ-032-05AY	
J1002	060G421017	RCA JACK	HTJ-032-05AW	
J4501	063G100042	SOCKET,21PIN	0350_9982_05	

ELECTRICAL REPLACEMENT PARTS LIST

REF. NO.	PART NO.	DESCRIPTION	
		SWITCHES	
SW551	0530205002	SWITCH PLUS	SDDFC30400
SW1001	0508221001	SWITCH (LEAF)	SPVF130100
SW1002	0504201T31	SWITCH,TACT	SKHVBED010
SW1004	0504201T31	SWITCH,TACT	SKHVBED010
SW1005	0504201T31	SWITCH,TACT	SKHVBED010
SW1006	0504201T31	SWITCH,TACT	SKHVBED010
SW1007	0504201T31	SWITCH,TACT	SKHVBED010
SW1008	0504201T31	SWITCH,TACT	SKHVBED010
SW1009	0504201T31	SWITCH,TACT	SKHVBED010
SW1010	0504201T31	SWITCH,TACT	SKHVBED010
SW1011	0504201T31	SWITCH,TACT	SKHVBED010
SW1012	0504201T31	SWITCH,TACT	SKHVBED010
		VARIABLE RESISTORS	
VR402	V1163H3BTC	VOLUME,SEMI FIXED	EVNCYAA03BE3
VR501	V1163Q3BTC	VOLUME,SEMI FIXED	EVNCYAA03BQ3
VR502	V1163Q3BTC	VOLUME,SEMI FIXED	EVNCYAA03BQ3 or
	V1263Q3BTC	VOLUME,SEMI FIXED	RH063MCS3R
		P.C.BOARD ASSEMBLIES	
PCB010	A547B3B010	PCB ASS'Y	VMX207B
PCB070	A547B3B070	PCB ASS'Y	TMX482A
PCB110	A547B3B110	PCB ASS'Y	TCX342A
PCB260	A547B3B260	PCB ASS'Y	VEX931B
PCB550	A545C9P550	SEE CHASSIS REPLACEMENT PARTS LIST	
		MISCELLANEOUS	
⚠ ANT001	125C108028	ANTENNA ROD	T4-216BP-BK
B501	024AT03481	CORE,BEADS	BL02RN1-R62T2
B502	024AT03655	CORE BEADS	BL01RN1-A63T6
B503	024AT03481	CORE,BEADS	BL02RN1-R62T2
B504	024AT03482	CORE,BEADS	BL02RN2-R62T4
B505	024AT03655	CORE BEADS	BL01RN1-A63T6
B507	024AT03482	CORE,BEADS	BL02RN2-R62T4
B508	024AT03482	CORE,BEADS	BL02RN2-R62T4
B851	024DT03581	CORE BEADS	LFP3A-M3R2TA
B4001	024AT03481	CORE,BEADS	BL02RN1-R62T2
B4501	024AC3601C	CORE,BEADS	BLM21A601SPT
B4502	024AC3601C	CORE,BEADS	BLM21A601SPT
B4505	024AT03655	CORE BEADS	BL01RN1-A63T6
B4506	024AT03655	CORE BEADS	BL01RN1-A63T6
BT101	1412004008	BATTERY,MANGAN	R03(AB)E_20_T
BT102	1412004008	BATTERY,MANGAN	R03(AB)E_20_T
CD351	06CH12444A	CORD CONNECTOR	CH12444A
CD503	069X620040	CONNECTOR	JM-2BK-61
CD504	121B164102	CORD,CAR BATTERY	SI-PC107-69
CD551	1206655816	CORD AC BUSH	6655816
CD552	06CPU2012A	CORD CONNECTOR	CPU2012A
CD653	06CH01408A	CORD EIS CONNECTOR	CH01408A
CD654	06CH014301	CORD CONNECTOR	CH014301
CD801	068M82025A	CORD CONNECTOR	8M82025A
CD803	122E042705	CORD JUMPER	2E042705
CD810	06CH28110A	CORD CONNECTOR	CH28110A
CD820	06CH2B026A	CORD CONNECTOR	CH2B026A
CD850	06CH25080A	CORD CONNECTOR	CH25080A
CF601	1022T38R9E	FILTER,SAW	SAF38.9MAK220Z
CF602	1012T04001	FILTER,CERAMIC TRAP	MKT40.4MA110P-TF
CP351	069X120249	CONNECTOR PCB SIDE	B2B-EH-A
CP401	069X440029	CONNECTOR PCB SIDE	B04B-DVS
CP402	069W01001A	CONNECTOR PCB SIDE	003P-2100
CP403	069W420029	CONNECTOR PCB SIDE	TV-50P-02-A1
CP501	0697U20129	CONNECTOR PCB SIDE	THL-P03P-B6 or
	0697320039	CORD UX CONNECTOR	THL-P03P-B1
CP502	069E280129	CONNECTOR PCB SIDE	8283_0812_00_000
CP503	069X620030	CONNECTOR PCB SIDE	RE-H022TD-1130
CP551	0697U20129	CONNECTOR PCB SIDE	THL-P03P-B6 or
	0697320039	CORD UX CONNECTOR	THL-P03P-B1
CP603	069E290129	CONNECTOR PCB SIDE	8283_0912_00_000
CP801	069W320018	CONNECTOR PCB SIDE	TS-80P-02-V1
CP820	069E2B0129	CONNECTOR PCB SIDE	8283_1112_00_000
CP850	069E250129	CONNECTOR PCB SIDE	8283_0512_00_000
CD1001	06CH01408A	CORD EIS CONNECTOR	CH01408A
CD1005	122F051704	CORD JUMPER	2F051704
CD1006	122S040804	CORD JUMPER	1.25X4X83XC
CD4005	122S061401	CORD JUMPER	1.25X6X138XC
CD4501	122F041207	CORD JUMPER	2F041207
CD4502	122F081003	CORD JUMPER	2F081003
CP1001	069R220021	CONNECTOR PCB SIDE	52287-0211
CP1004	0697280590	CONNECTOR PCB SIDE	TMC-J08P-B1

REF. NO.	PART NO.	DESCRIPTION	
		MISCELLANEOUS	
CP1005	069J750029	CONNECTOR PCB SIDE	IMSA-9604S-05Z14
CP1006	069J740029	CONNECTOR PCB SIDE	IMSA-9604S-04Z14
CP4001	0697240600	CONNECTOR PCB SIDE	TOC-C04X-B1
CP4004	0697120320	CONNECTOR PCB SIDE	TMC-T02X-E1
CP4005	069J760019	CONNECTOR PCB SIDE	IMSA-9604S-06Z13
CP4501	069J740029	CONNECTOR PCB SIDE	IMSA-9604S-04Z14
CP4502	069J780029	CONNECTOR PCB SIDE	IMSA-9604S-08Z14
CP4503	069J780029	CONNECTOR PCB SIDE	IMSA-9604S-08Z14
CP4504	069J740029	CONNECTOR PCB SIDE	IMSA-9604S-04Z14
CP803A	067R104019	WIRE HOLDER	51052-0400
CP803B	067R104019	WIRE HOLDER	51052-0400
CUS011	800WFAA006	CUSHION A	or
	800WF00004	CUSHION-A	
CUS012	800WFAA008	CUSHION C	or
	800WF00019	CUSHION-C	
F501	0808T04002	FUSE	218004
F502	0808T2R502	FUSE	21802.5
⚠ FB401	043210012R	TRANSFORMER,FLYBACK	3210012R
FH501	06710T0006	HOLDER,FUSE	EYF-52BC
FH502	06710T0006	HOLDER,FUSE	EYF-52BC
FH503	06710T0006	HOLDER,FUSE	EYF-52BC
FH504	06710T0006	HOLDER,FUSE	EYF-52BC
ICP502	083PC10002	MICRO FUSE	251010
OS1001	0779014002	REMOTE RECEIVER	GP1U281Q or
	077Q014003	REMOTE RECEIVER	PIC-28143SY-2
RY503	0560Q10201	RELAY	SDT-S-109LMR
⚠ SP351	070C732002	SPEAKER	SG08G26BNB or
	070W132003	SPEAKER	NS-300RW
TM101	076R0CH180	TRANSMITTER	R25-1716
⚠ TU601	0145511021	TUNER,VHF-UHF	TUWOF4EG-771F2
V801	0981100403	CRT W/DY	A22JWG098X80
X601	100CT4R406	CRYSTAL	HC-49/U
X851	100CT01302	CRYSTAL	HC-49/U-S
X1001	100CT01002	CRYSTAL	HC-49/U-S
X1002	100C32R803	CRYSTAL	DSVT-200
X4001	100CT4R407	CRYSTAL	HC-49/U

RESISTOR

RC..... CARBON RESISTOR

CAPACITORS

CC..... CERAMIC CAPACITOR
CE..... ALUMI ELECTROLYTIC CAPACITOR
CP..... POLYESTER CAPACITOR
CPP..... POLYPROPYLENE CAPACITOR
CPL..... PLASTIC CAPACITOR
CMP..... METAL POLYESTER CAPACITOR
CMPL..... METAL PLASTIC CAPACITOR
CMPP..... METAL POLYPROPYLENE CAPACITOR